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PLANTS

OF THE

COAST OF COROMANDEL;

SELECTED FROM

DRAWINGS AND DESCRIPTIONS

PRESENTED TO

THE HON. COURT OF DIRECTORS OF THE

EAST INDIA COMPANY,

BY

WILLIAM ROXBURGH, M.D.

PUBLISHED, BY THEIR ORDER, UNDER THE DIRECTION

OF

SIR JOSEPH BANKS, BART.

P. R. S.

VOL. I.

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PREFACE.

The present Fasciculus of Plants growing on the Coast of Coromandel, being the first of a progressive work, with which the Honourable Court of Directors of the East India Company has determined to favour the public, it is hoped, will prove as acceptable to the lovers of Botany in general, as useful at the Company's establishments abroad.

It is intended that the selection should be made from five hundred drawings and descriptions, presented to the Honourable Court of Directors by Dr. William Roxburgh, one of the Company's medical servants, and their Botanist in the Carnatic; and, with a more immediate view to utility, while preference will be given to subjects connected either with medicine, the arts, or manufactures, the liberality of the Honourable Court of Directors encourages the admission of new plants, or of such as have hitherto been imperfectly described, although their qualities and uses may as yet remain unexplored.

After all that has been already done, India still presents a wide field for research; and the progress made, of late years, in other branches of knowledge, affords room to expect material improvement in Natural History, if ardour for inquiry continues to prevail; if the means of making new acquisitions are facilitated; and if a spirit of scientific emulation among the Company's servants abroad, meets with such encouragement as must naturally tend to rescue many of those hours of leisure from indolent neglect, which (considering the fertile advantages of situation) might be employed with no less pleasure to the individual, than eventually to the public benefit.

Till within these forty years, Botany seems to have been little attended to in the Carnatic; about which period, if not introduced, it was at least greatly promoted by a foreign naturalist.

John Gerard Koenig, a native (it is believed) of Courland, and a pupil of Linnæus, contemporary with the late Dr. Solander, had early distinguished himself, by his travels into Iceland, in the year 1765,* and was honoured by having a plant named after him.

The precise time of his setting out for India is not known, but it was probably in 1768; as in a letter to Linnæus, dated from Tranquebar, July 26, 1769, he refers to another letter written more than three months before, which is not found among a number of his letters from India, now in the possession of Dr. James Edward Smith.

It appears that he went to India under the protection of the king of Denmark, partly as physician to the Danish settlement in the Carnatic, but chiefly for the purpose of making improvements in the natural history of that country; and he resided for several years at Tranquebar, or in its vicinity, indefatigably employed in researches of various kinds.

Koenig was singularly qualified for the employment he had engaged in. More covetous of fame than of fortune, he persevered in his pursuits with an enthusiasm that set bodily fatigue, spare meals, and a scorching climate at defiance; while the simplicity of his manners, and his unassuming readiness to impart knowledge to others, conciliated, almost at first sight, the benevolence of those with whom he conversed. Thus qualified for an inquisitive traveller, he became known at the Dutch, French, and British settlements on the Coast, which he occasionally visited in his excursions, and every where he acquired friends.

* Mantissa Linn. Gen. Pl. p 13.

Koenig, finding his slender salary at Tranquebar insufficient for the expence of requisite excursions into the country, however frugally conducted, was, by the interest of friends, introduced as a naturalist to the Nabob of Arcot, in whose service he remained for several years; during which he made excursions among the hills near Velore, Amboor, &c. and afterwards made a voyage to the island of Ceylon.*

His frequent residence at Madras, while in the Nabob's service, naturally led him into a more familiar intercourse with the English, of whom several seized the opportunity of profiting by his instruction. Dr. James Anderson, the present physician general at Fort St. George, when he occasionally speaks of mineralogy, always mentions him with gratitude.

Among the first of the English who attached themselves to Koenig, in the botanical line, was Mr. George Campbell, a young medical gentleman on the Madras establishment. They made a short excursion together into the Pullicate hills, in April, 1766;† and Mr. Campbell, on his return, candidly acknowledged to a friend, that he had learned more of practical Botany in one fortnight, than in the whole course of his former studies. By all accounts, Campbell was a youth of most promising talents. With a decided intention of prosecuting Botany, he gave a large commission for books on that subject from England; but they never reached him: for, being wounded, and taken prisoner, in the unfortunate defeat of Colonel Baillie's detachment, in September, 1780, he died a short time after, universally lamented.

Dr. Roxburgh, who entered into the service at Madras in the spring, 1766, had long applied to Botany, under Dr. Hope, then professor of Botany at the university of Edinburgh; and bringing with him to India the love of the study, he found in Koenig an experienced conductor through an unknown wilderness. Their friendship continued to the last; and Dr. Roxburgh takes a pleasure in acknowledging his obligations to his guide.

On a representation from Dr. Koenig to the Board of Madras, in 1778, that his finances were far inadequate to the extensive schemes he had in contemplation, and that his salary from the Nabob was irregularly paid, the Board, in consideration of his merit, was pleased to grant a monthly allowance, in order to enable him the better to prosecute his researches.

With this aid, he proceeded in the month of August to the Straits of Malacca, and Siam; from whence he returned towards the end of 1779. From his report to the Board of Madras, it appears, "that he had the good fortune to meet with several new subjects in natural history, and to make some "discoveries in Botany and Mineralogy, which he flattered himself might prove acceptable to the "public; particularly in respect to the article of tin ore." He mentioned at the same time his having had the honour of letters from the President of the Royal Society, and the Honourable Charles Greville, requesting specimens of his collection, which it was his intention to transmit to them, as the best means of rendering his discoveries useful in England. He intimated also his intention of sending to St. Helena, by the ships then on departure, the seeds of such esculent and other plants, and of such trees or shrubs as he had then got ready, and might probably be of use in that island.

Having now determined to devote his future time entirely to the service of the India Company, the Board of Madras was pleased, in 1780, to make an addition to his salary, which met with the approbation of the Honourable Court of Directors.

* His Ceylon journal is not among the papers bequeathed to Sir Joseph Banks; but some account of it is given by Hennings, in his description of Tanjore, and of the Danish colony at Tranquebar.

† The original sketch of Mr. Campbell's journal, is in the possession of Dr. Russell.

He soon after, in that year, made a short excursion to Trinkamaly; and early in the following year he made a second excursion to Columbo.

In the beginning of June, 1782, Dr. Patrick Russell, on his arrival in India, had the pleasure of meeting with Dr. Koenig at Tranquebar, who not only communicated the catalogue of his Coromandel collection of plants, but as an inducement to engage in Indian Botany, favoured him with a number of specimens. From that time commenced a correspondence, which was continued till within a fortnight of Dr. Koenig's death.

In 1784, Koenig fulfilled the promise he had given of a visit to his old friend Mr. Claud Russell, then chief at Vizagapatam. It was on his way to Bengal; but as he made some stay at Vizagapatam, Dr. Russell had time to submit to his examination a pretty large collection of plants made in that district, and to profit by his assistance in arranging them.* He took the opportunity also of urging to Dr. Koenig, (what he had more than once hinted before in correspondence,) the propriety of transmitting to the Court of Directors, a select Fasciculus of drawings and descriptions, by way of specimen of his labours; at the same time, earnestly recommending his making such a disposition, in respect to his manuscript papers, as might, in case of death, insure their falling into the possession of some one qualified to appreciate their merit, and not less able, than liberally disposed, to employ them in the manner most conducive to the writer's reputation.

In this last view, Sir Joseph Banks was considered, of all others the person most eligible. Koenig had been in correspondence with Dr. Solander, from the year 1774; and had from time to time transmitted specimens and seeds of plants for Sir Joseph.

Koenig departed from Vizagapatam, impressed with the justness of what had been suggested to him; but eager in the pursuit of new objects on the journey, and immersed in various avocations at Calcutta, he delayed from day to day, what he was conscious it was wrong to procrastinate, and on his return to Vizagapatam in April, 1785, he had executed no part of his former resolutions; though the declining state of his health at that time, rendered it more than ever expedient to prepare for an event, which he himself appeared to consider as at no great distance.

After a rest of two or three weeks at Vizagapatam, in which time he remarkably recovered his strength and spirits, he proceeded to Jagrenatporum, with a full resolution of immediately setting about the proposed selection; but towards the end of May, his distemper (which was a flux,) returning, he gradually sunk under it, in spite of the skill and friendly attentions of Dr. Roxburgh, and on the 26th of June expired.

On the 6th of that month he had made his will, bequeathing the whole of his manuscripts, and specimens of plants, to Sir Joseph Banks; of which he acquainted Dr. Russell in a letter dated the 12th. Some days before his death, he himself saw such papers as he was then in possession of, sealed up in the presence of Dr. Roxburgh, by whom they were despatched to Sir Joseph Banks, and arrived safely; but those dispersed in different places, particularly at Tranquebar, (among which unfortunately was his Ceylon Journal,) have hitherto not appeared, though Dr. Roxburgh and Dr. Russell did all in their power in India to recover them.

Though these manuscripts contained many valuable descriptions and observations, there was nothing

* On Dr. Russell's leaving India, the cabinet containing the above collection, considerably augmented, was presented by him to the Company, and deposited at the Presidency, with the approbation of the Governor in council.

found in a state fit for a distinct or separate publication; but they have afforded assistance to the present work, in which his botanical remarks will occasionally be inserted.*

Koenig had maintained a correspondence with Linnæus, as well as with other eminent Botanists in Europe, and several of his communications from India have been published in the Transactions of the Societies of Copenhagen and Berlin, or inserted in the works of Retzius, and other authors. A list of such publications † was supplied by Mr. Dryander, whose aid has also been of material service in the correction of descriptions, and in settling synonyma.

A few months after Koenig's death, Dr. Russell was nominated his successor; and allotted to Botany whatever time he could spare from the investigation of Snakes and Fishes, in which he had been engaged from the time of his arrival in India.

Considering it however as a public loss, if the design of Koenig should be entirely relinquished; and conceiving that many descriptions and remarks would be found among his papers, while drawings from the living plants might be made in India, Dr. Russell resolved to attempt a work limited to the useful plants of Coromandel; which, though perhaps less generally interesting to the Botanists in Europe, he was inclined to think might prove of real service to India.

His plan was first communicated to the Governor of Madras, but afterwards explained more fully in a memorial addressed to the Medical Board; and meeting with the unanimous approbation of both, it was transmitted to the Honourable Court of Directors.

In the interim, circular letters, with a list of the plants proposed for the first publication, was sent by the Medical Board to the subordinate settlements, requesting it might be favoured with any information respecting the subjects in question, which the medical gentlemen might have it in their power to communicate; and in consequence several useful communications were received.

In the memorial to the Medical Board, Dr. Russell had mentioned his hope that Sir Joseph Banks, if his advice were requested, might probably point out the best mode of carrying the plan into execution, and having before, in correspondence, hinted to him the design, then only in contemplation, he thought it now proper to transmit for his inspection, the explanatory detail contained in the memorial to the Medical Board.

The solicitation of private friendship was not requisite to induce Sir Joseph Banks to interest himself in a proposal which he considered as calculated for public utility: he not only, when applied to by the Court of Directors, expressed his approbation, but suggested some alterations in the original plan.

Thus corrected, the plan was returned to India, accompanied with a paragraph in the general letter to the Board of Madras, expressive of "the readiness, at all times, of the Court of Directors to promote "the improvement of Natural History, and of their approbation of Dr. Russell's proposal for publishing "a select collection of useful Indian plants; but desired that the alteration suggested by Sir Joseph "Banks, should be attended to."

Before the arrival of the above letter at Madras, Dr. Russell had left India. The directions it contained, however, fell fortunately into hands well qualified for carrying them into execution.

Dr. Roxburgh of Samulcottah, who had lived much with Koenig, and, when disengaged from the duties of his station, had pursued his favourite study, succeeded to the botanical department. He had made large collections of plants in the Carnatic; and, for several years previously to his appointment,

* List of Koenig's manuscripts, received by Sir Joseph Banks, will be found at the end of the Preface.

† See the end of the Preface.

had retained a painter constantly employed in drawing plants, which he accurately described, and added such remarks on their uses as he had learned from experience, or collected from the natives.

Of these drawings and descriptions, which he devoted to the Honourable Court of Directors, the first parcel was received in 1791; others followed in succession; and the last parcel, which completed the number of five hundred, arrived in 1794. It is from these that the present Selection has been made; but many more drawings remain in India, ready to be sent home by the first opportunity.

Dr. Roxburgh's industry has also for some years been employed in the cultivation of pepper and indigo, in one of the Northern Circars; and, besides a letter on the qualities of the Swietenia Bark, published by order of the Directors, he has communicated other discoveries, to be found in the Philosophical Transactions, the Indian Repertory, and the Asiatic Researches. Such commendable zeal in the service has not passed unnoticed by the Court of Directors, which has lately honoured him with a handsome present of botanical books, as well as with other marks of approbation.

On the 4th of July, 1794, after the last parcel of drawings was delivered to him, Sir Joseph Banks, in compliance with his former promise to the Court of Directors, presented a plan, and an estimate of the expence of the proposed publication, accompanied with specimens of the engravings. He was pleased to add, "For my part, I am most ready to undertake the general overlooking of the work, to "set the engravers their tasks, and to see that they are executed with accuracy: Dr. Russell (Dr. Rox-"burgh's predecessor) will I am sure readily assist in correcting the press of the descriptions." He at the same time recommended as the publisher, Mr. Nicol, his Majesty's bookseller, who had formerly assisted him in the publication of Captain Cook's Voyage.

An answer from the Court of Directors to this letter was returned on the 11th of the same month, in which they gave their assent to the execution of the work, exactly in the way that Sir Joseph had pointed out; and, in very polite terms, expressed a sense of obligation for the assistance, with such liberality offered, of superintending the publication.

The writer of this Preface willingly undertook the part allotted him, in the absence of his friend Dr. Roxburgh, on whom the task should naturally have devolved; but the Doctor is still labouring in India; and, having lately been appointed Inspector of the Botanical Garden at Calcutta, may possibly be induced to protract his stay in that country longer than he some time ago intended.

The foregoing narrative of the origin and progress of the present work, it is presumed, will not be deemed impertinent. It pays a small tribute to the memory of Koenig, to whom Indian Botany stands so highly indebted: it shows the disposition of the Honourable Court of Directors to promote science in India; and produces an example for the encouragement of the Company's servants abroad, to dedicate their leisure hours to useful research, as a means of recommendation to the notice of their superiors, as well as of obtaining a well earned reputation in their native country.

PAT. RUSSELL.

London, March 20, 1795.

List of Dr. KOENIG'S *Manuscripts, received by* SIR JOSEPH BANKS.

Journal of his Voyage to Siam, commencing August 8, 1778, and ending abruptly December 12, 1779. The part from February 22, to the end of April, is wanting.

Journal of his Voyage from Madras to Trinkamaly, commencing April 15, 1780, and ending May 11, when he still was in Trinkamaly.

Journal of his Voyage from Nagore to Ceylon, commencing January 7, 1781, and ending April 11, when he was still in Ceylon. From a memorandum in another place, it appears that he returned to Tranquebar August 23.

The rest of his manuscripts consists chiefly of descriptions of plants: very little in them relates to animals, and still less to minerals. They are collected together in nineteen volumes.*

* Several letters to Linnæus, on the subject of Iceland, as also respecting the East Indies, are in the possession of the President of the Linnæan Society.

A List of various Publications by Dr. KOENIG.

A Treatise on the White Ants, is found in the fourth volume of the Berlin Transactions.

An Account of the Ebony Tree; in the first volume of the Transactions of the Society of Lund.

Several letters, relating to the Natural History of the East Indies; in different volumes of the Transactions of the Royal Society of Copenhagen, and of the Society of Berlin: as also in the Naturforscher.

A great number of plants discovered by Koenig, are found in Retzii Observationes Botanicæ. In the third Fasciculus, are printed Koenig's Descriptiones Monandrarum; and in the sixth, his Descriptiones Epidendrorum.

An Account of his voyage to Ceylon, in 1777, is found in Hennings's Description of Tanjore, and the Danish colony at Tranquebar.

In part XX. of the Naturforscher is an Account of a new Genus of Plants, called Xylocarpus.

In the ninth volume of the Commentationes of the Society of Gottingen is a Memoir, by Professor Murray, on the Trees which produce the Gummi Gutta, entirely drawn up from Koenig's papers, sent to Professor Murray by Sir Joseph Banks.

In the first volume of the Transactions of the Linnæan Society, Mr. Dryander has published Koenig's Description of a new Species of Begonia; and in the second volume, his Description of Jambolifera.

1. GYROCARPUS JACQUINI.

Gærtn. sem. 2. *p.* 92. *tab.* 97.

Gyrocarpus americanus. *Jacqu. amer.* 282. *t.* 178. *f.* 80.
Afrag. *Voyage de Le Brun en Perse, vol.* 2. *p.* 257. *cum fig.*
Tanucoo of the Telingas.
Cattamaran Wood Tree.

GENERIC CHARACTER.

HERMAPHRODITE. *Calyx* above, four-leaved, unequal. *Corol* none. *Nectary* four clubbed glands. *Stamens* four. *Pistil* one. *Style* none. *Capsule* one-celled, one-seeded, ending in two long membranaceous wings.

MALE. *Calyx* five-leaved, equal. *Nectary* and *Stamens* as in the Hermaphrodite, without pistil.

DESCRIPTION.

Trunk in general erect: *Bark* smooth, greenish ash colour.

Branches thin, irregularly spreading in every direction.

Leaves approximated about the extremities of the branchlets, petioled, broad hearted, three-nerved, frequently slightly lobed, above smooth, below downy; there are two pits on the upper side of the base; length and breadth various, but in general five or six inches each way.

Petiole round, downy, three inches long.

Panicles terminal, umbell-like: divisions two-forked.

Flowers very small, yellow.

Hermaphrodite Flowers solitary, sessile, in the divisions of the panicle.

Calyx above, four-leaved: leaflets unequal; exterior pair small, oval, falling; interior pair large, wedge-shaped, three-toothed, permanent, and increasing in size with the pericarp into two long membranaceous wings.

Corol none.

Nectary four clubbed, yellow, glands.

Filaments four, longer than the calyx, inserted alternately with the nectarial glands into a perforated receptacle.

Anthers quadrangular, opening on each side with an oval lid.

Germ below, egged.

Style none.

Stigma small, immersed in the perforation of the receptacle of the filaments and nectarial glands.

Capsule globular, wrinkled, one-celled, one-valved, does not open, size of a cherry, ends in two long, obtuse, lanced, membranaceous wings.

Seed one.

OBSERVATIONS.

This grows to be a very large tree, is chiefly a native of the mountainous parts of the coast, casts its leaves about the end of the wet season; flowers during the cold season when the tree is naked; the leaves come out soon after.

The wood of this tree is white and very light, is employed to make cattamarans (rafts), when to be had, in preference to any other.

2. SIRIUM MYRTIFOLIUM.

Linn. Mant. 200.

Sandal Wood Tree.

Leaves opposite, short-petioled, spreading, lanced, entire, waved, smooth, shining, about two inches long, and three-quarters of an inch broad.

Stipules none.

Raceme thyrse-like, terminal, compound, small, erect.

Flowers small, red.

Calyx above, belled, four-cleft: divisions egged, expanding, coloured.

Corol none, except the nectary be such.

Nectary four-leaved, inverse-hearted, notched, inserted into the mouth of the calyx.

Filaments four, short, hairy, inserted into the calyx alternately with the leaflets of the nectary.

Stigma four-lobed.

Berry globular, size of a large pea, smooth, juicy, black when ripe, one-seeded.

This valuable tree is a native of many parts of India: here, in the Circar mountains, where it is wild, it is but of a small size, and the wood of little value. On the Malabar coast it is much larger, and the wood reckoned of the best sort.

The wood of this tree is the white and yellow Sanders, Santalum album et flavum of the Materia Medica; both the sorts are the produce of the same tree, and not, as Garcias says, of different trees. Most trees in India, when large and old, become coloured towards the centre, that part is always much more hard and durable than the exterior uncoloured part. It is the same with the Sandal tree: the centre, when the tree becomes large, acquires a yellow colour, great fragrance, and hardness; while the exterior part of the same tree, that covers the coloured part, is less firm, white, and without fragrance. It is only the yellow sort that is of use; and the larger the tree the more valuable is the wood, it having then acquired a greater degree of fragrance, for which alone it is held in such universal estimation.

Birds eat greedily the berries, by which means it is propagated extensively.

3. OLDENLANDIA UMBELLATA.

Linn. Spec. Plant. 174.

Tsheri-vello of the Telingas.
Saya-ver, or Imburel of the Tamuls.
Chay Root, or East India Madder of the English.

Root very long, from one to two feet, slender, with few lateral fibres, when fresh the bark is orange coloured; in the cultivated sort it is longest, and with fewer fibres.

Stem in the cultivated sort erect, round, jointed below, very ramous, somewhat scabrous, from six to twelve inches high.

Branches axillary, the under opposite, decussated, spreading horizontal, and nearly as long as the stem; above alternate, or in pairs from the axill.

In the wild sort there is scarce any stem, but many diffuse scraggy branches, with their flower-bearing extremities erect.

Leaves opposite, tern or quatern, sessile, linear, pointed, scabrous, spreading, from $\frac{3}{4}$ to $\frac{1}{2}$ inch long, by $\frac{1}{3}$ broad; in the axills of the principal leaves are generally fascicles of smaller leaves.

Stipules connecting, ciliated.

Flowers terminal, small, white, very numerous, the whole forming a large umbell, composed of small three-cleft umbellets.

Bracts minute, awled.

The parts of fructification agree exactly with those of the genus.

This is a small biennial, rarely triennial plant, it grows in very light dry sandy ground near the sea. Flowers during the latter part of the wet season; seed ripe in January.

It is much cultivated on the coast of Coromandel, and grows best in the purest and lightest sand, there its roots descend to a great depth. Cattle are penned upon the ground for some time before it is sown, to manure it, or some other manure employed, generally the lightest; it is then cleared of weeds, and its surface made level, if not so before. The seeds are mixed with much sand, and sown as soon as the rains begin in June, or July (that is in the Circars); the sand is mixed with the seed to enable the sower to sow it sufficiently thin; it requires to be often watered if showers are not frequent, till the plants are about two or three inches high. The first watering is peculiar; some fresh cow-dung is mixed with the water, the chief object of which is to give the sand at the surface some degree of adhesion, which prevents the strong winds that prevail at this season from blowing away the seeds; after, it requires little or no care, few weeds grow in such a soil as fits this culture, of course a very little labour keeps it clean: if the season is remarkably wet, the quality of the roots are much injured, and the drier the season the richer they are in colour and quality. In February, which is seven or eight months from the time the seeds were sown, the roots are reckoned to be in a proper state for taking up; to effect which a trench is made along the side of the field, fully as deep, or rather deeper than the length of the longest roots, which may be reckoned two feet; a two-pronged fork is then employed to undermine the ground, and as it falls in, the roots are taken up, the stems and branches cut off; the entire roots dried in the sun, tied up in small bundles of a few ounces, and kept in dry airy places, which is all the preparations it receives from the cultivators: it will remain good three, four, or even five years, and the dyers and chints painters, who are the people best acquainted with this root, say its colouring powers improve by keeping for that length of time; a fortunate circumstance for its exportation to Europe. When the wild sort can be had in any quantity, it is esteemed one-third, or one-fourth stronger, and, which is of more consequence, yields a better colour: and when these roots can be had of two years growth, they are reckoned still better, but the farmer does not find it answers his purpose to let it be longer in the ground than one season.

The woody part of the root is white and tasteless, it is the bark only that is possessed of the colouring principle; when fresh it is orange-coloured, tinges the spittle yellow, and leaves a light degree of acrimony on the point of the tongue for some hours after chewing; to appearance it loses its yellow colour in drying, but still retains the abovementioned properties on being chewed. It impregnates cold water or spirits of a straw colour; to boiling water it gives a brownish porter colour. The watery infusions and spirituous tinctures are changed into a bright and deep red by alkaline substances; and are rendered paler, or nearly destroyed, by acids. I have tried various experiments to enable me to dye red with this root (I may say two or three hundred), in a more expeditious and less troublesome way than what the natives follow, but all with no satisfactory success; it is therefore unnecessary for me to detail these experiments in this place (however, I doubt not but a person well acquainted with the art of dying might effect it); all that is necessary for me to say at present, is to give the process for dying, painting, or printing red with this root, as practised by the natives in the Circars.

A receipt for dying red with these roots, as practised in the Masulipatam district, suppose one square yard of pretty fine cotton cloth, which has been previously bleached.

First. Take of the coarsely powdered root one or one and a half ounce, boil it gently for a few minutes in three pints of soft water; in this dip the cloth repeatedly for a few minutes, wring and wash it out in cold water, and dry it in strong sunshine upon sand or gravel.

This first operation is to take out any remains of the quick-lime, &c. employed by the bleachers in whitening the cloth.

Second day. Take half an ounce of the outer covering of caducay nuts (nuts of Terminalia citrina), in powder, mix it in a pint of cold water,* let it stand a little, then strain it through a bit of thin rag, with this mix a third part of fresh buffalo's milk (I believe cow's milk is as good); in this wash or rub the cloth thoroughly, wring it gently, and dry it in the sun.

Third day. The cloth is washed out in cold water; yesterday's operation repeated;† when finished, the cloth feels very harsh; to soften it, it is folded up and very well beetled.

Fourth day. A quarter of an ounce of alum and as much turmerick in powder are infused in a pint of cold water for a few hours; the beetled cloth is now spread out on grass, and exceedingly well rubbed with the above mixture; when dry (if to be coloured on both sides) it is turned, and equally well rubbed with the same mixture on the other side; then dried and put by.‡

Fifth day. This day the cloth is only well washed in cold water, and dried in the sun.

Sixth day. The fourth day's operation of rubbing both sides, &c. is repeated.

Seventh day. Wash it well in cold water, and while moist, wet it in a cold infusion of a little powdered caducay; dry it in the sun or shade.

The Malabars omit this part of the operation.

Eighth day. Take six pints of water and a pound of chay root, put them on the fire, and when scalding hot put the unwashed cloth into it, to be kept in a scalding heat, stirring and turning the cloth frequently for three or four hours; the waste of water may be supplied by now and then adding to it; the cloth is suffered to remain in the liquor till cold, then wring it out half dry, and again return it into the same decoction, which is now made to boil gently

* Over the southern parts of the coast the powdered caducay is exceedingly well boiled in water, and the strained decoction mixed with only a fourth part of milk.

† To the southward this operation is performed in the same manner, but with only one-eighth of milk to the water and caducay. Beetling the same.

‡ South among the Malabars, this operation differs much from the above; it is done as follows. Take of sapan wood (Cæsalpinia sappan) in shavings one ounce, water a pint and a half, mix and let them stand for two days, then boil them till a third is gone; to this decoction while hot add three-quarters of an ounce of powdered alum, with this the cloth is rubbed on both sides, &c. as is done above with turmerick, &c. on the fourth, fifth, and sixth day.

for five or six hours, stirring, &c. as above; the fire is then to be withdrawn, and the whole left to cool till next day. The cloth is now of a dirty deep brick-dust colour.

The Malabars perform only the first part of this day's work.

Ninth day. The cloth is washed in cold water, well wetted in a cold infusion of caducay and water, dried and put by, as on the seventh day.

Tenth day. Wash the cloth in cold water, and boil it gently for two hours in a decoction of a quarter of a pound of chay root in six pints of water, suffer it to cool in the decoction as before; then wring it out, dry it, and put it by.

This part of the operation, as well as that of the ninth day, the Malabars omit.

Eleventh day. The cloth is to be worked about for a short time in as much water, well mixed with fresh cow-dung, as will cover it, then wrung out, and dried in the sun.

Twelfth day. The cloth is washed, spread out to the sun, and sprinkled with water as it dries, for a day.

Thirteenth day. The operation is finished by washing with soap, which improves the colour; and the oftener it is washed, the brighter the colour becomes.

I have in the above pointed out whenever the Telinga operators differ from the Malabar. I believe the Telingas are esteemed the best artists; however, of this I cannot well determine, as durability, as well as the immediate appearance of the colour, must be taken into consideration.

It may be proper to observe, that in dying with these roots the heat is always gentle, it is probable that these contain some other principle, which a strong heat might extract, and debase the intended colour.

They are also used by the natives to dye brown, purple, and orange, with their various shades.

Cotton cloth, previously prepared with a solution of alum, receives from a decoction of this root and tartar, a pretty good yellow colour; but it is changed to a pale red on being washed with soap: this points out strongly the powers of an alkali on the colouring matter of this root.

To dye purple with chay roots, as practised by the natives in the Masulipatam district.

First. The cloth (suppose four yards) is to be washed in a hot decoction of the root, dried, and next day wetted in an infusion of caducay in milk and water, as practised in dying red. On the

Third day, take two quarts of clear sour conjee (rice gruel) and one pint of cassim,* mix them very early in the morning, and first beating off the dew, if there is any, spread out the cloth on the grass, and rub both sides of it with the above mixture, as directed above with the turmerick infusion in dying red; this part of the operation is only done once on each side here.

Fourth day. The cloth is well washed in cold water, and boiled gently for one hour in a decoction of chay roots (say three pounds in eight gallons of water), let it remain in the decoction till cold, then wring it, and dry it.

Fifth day. It is boiled as yesterday in a fresh decoction of the roots, which is only half so strong (viz. one pound and a half to eight gallons of water); it is immediately removed from the dye,

* Cassim is the Telinga name of a solution of iron in a vegetable acid, and is prepared as follows. Take Palmira toddy (juice of Borassus flabelliformis) one gallon, into which put some broken pieces of the vitrified matter of a blacksmith's forge, and some bits of old rusty iron, let the whole stand exposed to the sun for ten days; then pour off the liquor clear for use.

after being suffered to cool, into a mixture of fresh cow-dung and water, where it remains for the night.

Sixth day. It is exposed to the sun, and watered as it dries, &c. as for finishing the red dye.

To dye a deep but clear brown with chay root, as practised by the same people; say four yards of cotton cloth.

The cloth is first to be dyed red, as above described, till we come to the bucking in cow-dung, which is to be omitted; and in its stead, the cloth is to be well wetted in the mixture of caducay in milk and water, and dried in the sun.

Second day. Very early, the cloth is spread out, and both sides rubbed with the cassim, &c. as has been already mentioned for purple, but with this difference, that here each side must be done twice over.

Third day. When it is well washed in cold water, and boiled gently for one hour in a decoction of the chay root, let it remain in the liquor till cold, then wring it, and half dry it; when it must be returned into the same decoction, and boiled for another hour, the operation is finished by bucking in cow-dung, &c. as for red and purple.

To dye orange with the same root, as practised by the same people; say four yards of cotton cloth.

First. Wash in a scalding decoction of the root, as for red.

Second day. Take aldecay (galls of Terminalia citrina) and the outer cover of caducay nuts, of each four ounces in powder, and infuse them in three or four pints of warm water, strain the mixture through a bit of thin rag, in which dip the cloth repeatedly till well wetted, wring and beat it a little, then dry it; and repeat the wetting in the above mixture, beating and drying. Next day, dissolve two ounces of alum in a quart of water, with this wash the cloth, and put it out to dry. Next day it is to be wetted in a weak lixivium of alkaline earth (earth of cretaceous soda) and quick-lime, wrung out and dried. Next day, wash it out in cold water, and boil it once only, and for one hour, in a decoction of chay; let it remain in the liquor till cold; dry it, and put it by till next day, then finish the operation by washing with soap.

To paint the red figures on chints with these roots, as practised by the chints painters in the Masulipatam district.

It is necessary to observe, that for every sort of chints, whether painted or printed, the cloth must first be bleached, then well washed out in a scalding decoction of chay root, and wetted in a cold mixture of milk, water, and powdered caducay, as practised to prepare the cloth for the red dye before mentioned; (this last part of the process is by the Malabars done with a strong decoction of the aldecay, as for the red dye.) This mixture they say prevents the colours that are to be applied from running, as pounce does ink on bad paper; and it is also found that milk is absolutely a necessary part of the mixture, for an infusion or decoction of the nuts will not answer without the milk. The abovementioned work occupies two days generally.

Third day. The cloth is now well beetled, and the figures traced, or marked out by applying pieces of paper over the prepared cloth, that has all the outlines pricked with a pin, a small bag of finely powdered charcoal is rubbed backwards and forwards over the paper, a sufficient quantity of the powder will pass the holes in the paper to mark distinctly the outlines of the figures; when this part of the work is finished, these lines marked out by the charcoal that are to be red, yellow, or orange, with their various shades, are to be done over with a cold watery infusion of sappan wood (Cæsalpinia

sappan) and alum, which has been prepared a day or two (the Malabar painters boil the sappan wood, as mentioned before for dying); and those that are to be purple, blue, or green, with their shades, are done with the martial solution, called by the Gentoos Cassim, which has been already taken notice of.

The chints painter's pencil is the most simple that can be conceived; a small bit of bamboo or other stick, tapering to a point like a skewer, and split at the point for about one inch, with a bit of rag or a little hair tied round it about an inch from the point, in form of a ball; this receives and retains the colour employed, and the point of the pencil is kept moist by gently squeezing the moistened ball, which is easily done by the hand that holds the pencil: with wonderful dexterity a good painter will run over a piece of cloth in this manner.

Fourth day. The operation of delineating the outlines of the figures being over, the cloth washed in cold water and half dried, a decoction of chay root is prepared, about ten or twelve ounces in powder to each gallon of water, sufficient to cover the cloth perfectly, so as to let it be easily moved about in the liquor during the boiling, which must be gentle, and for about an hour and an half; the cloth must remain in the liquor till perfectly cold, it is then washed out in cold water, and dried.

Fifth day. The next work is to repeat the first part of the operation, viz. to wet well the half finished cloth in a mixture of powdered caducay nuts in milk and water, and dry it in the sun or shade.

Sixth day. The parts that are to be of the best and brightest red are now shaded with an infusion of turmerick and alum in cold water, (such as was employed on the fourth day in dying red) those that are to be red-purple (the literal translation of the Telinga words yerra-bannas, which is a deep brownish purple) have the light shades covered with wax, which is done with the common painting pencil above described and melted wax: when finished, these parts are to be done over with the following mixture; cassim one part, sour conjee (pullagalli of the Telingas) and infusion of sappan wood, each four parts; the wax prevents this colour from tinging the parts it adheres to: the work is dried in the shade, and put by for that day.

Seventh day. It is washed in cold water, when half dry boiled in a decoction of the roots, as on the fourth day, and when cold well wrung out, and immediately wetted in the mixture of milk, water, and caducay, as on the second day, only the proportion of milk is diminished, dried, and put by till next day.

Eighth day. The parts that are to be of the best red, as mentioned on the sixth day, have the parts that are to be shaded light, covered with wax, and over the whole of these the turmerick infusion with alum is to be applied the second time.

Ninth day. Wetted in cold water for a few minutes, and dried in the sun.

Tenth day. The parts done with turmerick, &c. as on the eighth day, must be again done over with the same colour, which is the third time. The parts that are to be purple have their light shades done with melted wax, and covered with a mixture of one part of cassim and two of sour clear rice gruel.

Eleventh day. Wash it in cold water, and boil it in a decoction of chay for one hour or so, half dry it in the shade; then return it into the decoction, boil it again for some time, half dry, &c. repeating the boiling, or rather scalding, and half drying, for they must be gentle, for the whole of this day; at night it is put into a mixture of fresh cow-dung and water, and there remains till the morning.

Twelfth day. It is washed out, exposed on grass to the sun, and watered as it dries; this requires two or three days to make the unpainted parts of the cloth perfectly white again, for the chay will not stand bleaching, except where it has been fixed with alum; on such places it stands every sort of washing and bleaching, provided the process has been properly performed: those parts in the above description are the flowers, &c. that were done with the infusion of sappan wood and alum, or with that of turmerick and alum, or both; neither the sappan nor turmerick infusion alone are of themselves essential for fixing the colour of this root, they serve to lighten them, but the durability depends chiefly, if not entirely, on the alum with which they were mixed.

Fifteenth day. The twelfth, thirteenth, and fourteenth having been employed to whiten and clean the cloth, it is now starched with a decoction of rice, dried in the sun and beetled, when it is ready to receive the wax, which is melted, and with the pencil or a small brush laid over every part of the cloth that is not to be blue or green; when that is performed, it is put into the cold blue vat (which must be in a proper state for dying) for a few minutes, then exposed to the air, dipped and exposed to the air alternately till it has received a sufficient quantity of the dye, wrung half dry and washed out in cold water; it is then put into scalding water to take off the wax (which is not injured by the operation, but serves to wax other pieces with); the cloth, or rather nearly finished chints, must now be washed with soap and cold water, and left in a weak solution of soap the whole night.

Sixteenth day. In the morning wash it out with more soap and cold water; expose it to the sun on the grass, and sprinkle it with water as it dries, at night wash it in cold water and put it by.

Seventeenth day. Wash it out with soap and water, and expose it to the sun, sprinkling it with water as it dries for two or three hours only; wash it in cold water, and dry it in the sun; the whole is now to be wetted in a mixture of milk and water, dried in the sun, and put by till next day.

Eighteenth day. Take a small quantity of aldecay in powder, boil it well in a little water, with this, when cold, the parts that are to be green (they having been already dyed blue) are painted over and dried in the shade; after which they are to be done over (fixed) with a strong solution of alum, and dried in the shade. A strong lixivium of washerman's earth (earth of cretaceous soda) is now prepared, the chints is well wetted in it, wrung out, and put by for the night.

Nineteenth day. Wash it out with cold water, and then with soap and water; then expose it to the sun, and sprinkle it with water as it dries for a few hours; after which it is to be washed again in cold water, and dried in the sun. There now remains only that part of the process which prepares it for the market, viz. starching, beetling, and chanking; this last is similar to calendering, which is performed with a smooth shell rubbed backwards and forwards over the painted side of the chints, till it has acquired a very high gloss or polish.

The Telinga physicians do not give any part of the plant a place in their Materia Medica; but the Malabar physicians say that the roots cure poisonous bites, the cold, and the itch, and warm the constitution.

4. STRYCHNOS NUX VOMICA.

Linn. Spec. Plant. 271.

Musadie of the Telingas.

Trunk short and crooked, but pretty thick.

Branches irregular: both are covered with smooth ash-coloured bark.

Leaves opposite, short petioled, round-oval, shining, smooth on both sides, entire, three-five-nerved, differing in size, from one and a half to four inches long, and from one to three broad.
Stipules none.
Flowers small, greenish white, collected on small terminal umbells.
Calyx lasting.
Corol as in the genus.
Filaments scarce any, or exceeding short, inserted into the divisions of the corol.
Anthers half within the tube, and half out.
Style length of the tube of the corol.
Berry round, smooth, size of a pretty large apple, covered with a smooth somewhat hard shell, of a rich beautiful orange colour when ripe, filled with a soft jelly-like pulp.
Seeds from two to five, immersed in the pulp of the berry.

A middling sized tree, is common in almost every part of the coast. Flowers during the cold season. The wood of this tree is hard and durable, and is used for many purposes by the natives. It is exceeding bitter, particularly that of the root, which is used to cure intermitting fevers, and the bites of venomous snakes, when that of Naga-musadie cannot be had. The seeds are employed in the distillation of country spirits, to render them more intoxicating. The pulp of the fruit seems perfectly innocent, as it is eat greedily by many sorts of birds.

There is a tree, but exceeding rare on this coast, which the Telingas call Naga Musadie (Naga, or Tansoo Paum in the Telinga language means the Cobra de Capella or Coluber Naja of Linnæus, tansoo means dancing, and paum snake, this sort being famous for erecting its head, and moving it from side to side at the sound of music) *i. e.* Cobra de Capella Musadie. I have only once met with it, and then it was pointed out to me by a Telinga physician. The tree had been cut down and carried away some time before, most of the roots were also dug up and carried away; from the only remaining one that I could find, some shoots had sprung up. The leaves upon these were opposite, short petioled, obtuse, lanced, three-nerved, about two or two and a half inches long, by three-quarters broad; the petioles were very short, and connected at their insertions by a membrane, as in the natural order of Rubiaceæ. I took up this root with the greatest care, cut off the upper part from whence the shoots grew, and planted it in my garden; but it soon perished. From the above circumstances I am inclined to think there is a species different from the Nux vomica tree, which yields the real Lignum Colubrinum. The wood of the root of this sort is esteemed by the Telinga physicians an infallible remedy for the bite of the naga, as well as for that of every other venomous snake: it is applied externally, and at the same time given internally; it is also given in substance for the cure of intermitting fevers.

In the plate, the dissected flower is magnified; the fruit of its natural size.

5. STRYCHNOS POTATORUM.

Linn. Suppl. 148.

Induga of the Telingas.
Tettan-Kottah of the Tamuls.
Clearing-nut of the English.

The description of this tree in the Supplementum Plantarum is so perfect, as to leave me little to add; the only observations I have to make are, that the leaves cannot be said to be five-nerved.

Stipules entire, connecting.
Panicles from the extremities of the last year's shoots, round the base of this year's, bearing a few small, erect, fragrant, greenish-yellow flowers. *Filaments* rather longer than in Nux vomica.
Berry shining, black when ripe.

This species grows to be a larger tree than the Nux vomica tree, it is much scarcer, being only found among mountains, and woods of great extent. It flowers during the hot season. The wood, like that of the former, is hard and durable, and used for various economical purposes. The pulp of the fruit when ripe is eat by the natives; to me the taste is rather disagreeable.

The ripe seeds are dried and sold in every market, to clear muddy water. The natives never drink clear well-water if they can get pond or river water, which is always more or less impure according to circumstances. One of the seeds, or nuts, as they are generally called, is rubbed very hard for a minute or two round the inside of the vessel containing the water, which is generally an unglazed earthen one, and the water left to settle: in a very short time the impurities fall to the bottom, leaving the water clear, and, so far as I have been able to learn, perfectly wholesome. These nuts are constantly carried about by the more provident part of our officers and soldiers, in time of war, to enable them to purify their water; they are easier to be had than alum, and are probably less hurtful to the constitution.

In the plate, the dissected flower is magnified; the fruit of its natural size.

6. TECTONA GRANDIS.

Linn. Suppl. 151.

Theka. *Rheed. mal.* 4. *p.* 57. *tab.* 27.
Iatus. *Rumph. amb.* 3. *p.* 34. *tab.* 18.
Teké of the Telingas.

Trunk erect, growing to an immense size. *Bark* ash-coloured.
Branches cross-armed, numerous, spreading: young shoots four-sided, sides channelled.
Leaves opposite, petioled, spreading, egged, a little scolloped, above scabrous, below covered with white soft down; they are larger at a distance from the flowers, and on young trees from twelve to twenty-four inches long, and from eight to sixteen broad.
Petiole short, thick, laterally compressed.
Panicle terminal, very large, cross-armed, small: divisions dichotomous, with a sessile fertile flower in each cleft; the whole covered with a hoary-coloured farinaceous substance.
Peduncle common, quadrangular, sides deeply channelled, angles obtuse.
Bracts opposite, lanced, two at each subdivision.
Flowers small, white, very numerous, fragrant.
Calyx and *Corol* as described in the Supplementum Plantarum, only oftener six than five-cleft.
Nectary very small, often wanting.
Stamens oftener six than five.
Stigma two-cleft: divisions obtuse, spreading.
Drupe within the enlarged inflated dry calyx, obtusely four-sided, woolly, spongy, dry.
Nut exceeding hard, four-celled.

This most useful tree is a native of various parts of India, viz. of the mountainous part of the Malabar and Coromandel coasts, of the

mountains bordering on the banks of the Godavery above Rajahmundry, Pegu, &c. &c. Lord Cornwallis and Colonel Kyd have begun some time ago to introduce it into Bengal, where it thrives well. On this coast it flowers in the hot season. Seed ripe in August and September.

The wood of this tree, the only useful part of it, from long experience has been found to be by far the most useful timber in Asia; it is light, easily worked, and at the same time both strong and durable: that which grows near the banks of the Godavery is beautifully veined, considerably closer in the grain and heavier than any other I have seen; it is therefore particularly fit for furniture, gun carriages, &c. where small timber is wanted. For ship building the teke is reckoned superior to any other sort of wood, being light, strong, and very durable, either in or out of the water. Pegu produces the largest quantity, the large rivers there enable the natives to bring it down to the sea ports from the interior mountainous parts of the country, where it grows, at a cheap rate, which enables them to sell it lower than in any other part of India.

7. CEROPEGIA BULBOSA.

Manchy Mandu of the Telingas.

Root bulbous, solid, a little flattened, with several fibres from it base, size of a small turnip.
Stem twining, herbaceous, smooth, succulent, from two to four feet long.
Leaves opposite, short petioled, obverse-egged, with a small point; entire, fleshy; size various.
Umbellets lateral, length of the leaves, peduncled, few-flowered, direction various.
Flowers pretty large, erect: tube greenish, border purple.
Calyx below, five-toothed, toothlets acute, permanent.
Corol one-petaled; tube swelled at the base, contracted about the middle, enlarging from thence to the mouth: border five-parted: segments linear, downy, purple, erect; tops united, gaping at the sides.
Nectary composed of five compound bodies, which surround and hide the pistil; from each rises a curved filament, which is about half the length of the tube.
Anthers, if they can be so called, for they are only yellow scales; five pair resting on the black pointed angles of the stigma, (corpus truncatum.)
Germs two, united.
Styles seemingly two, united, short, thick.
Stigma (corpus truncatum) large, targeted, five-cornered, before the flowers open these corners adhere firmly to five incurved yellow glandulous parts of the nectary, and between them the anthers; it requires some force to separate them to have a view of the anthers; afterwards, when the flower is full blown, they separate of themselves; the anthers are then seen poised, as it were, on the five black pointed angles of the stigma.
Follicles two, slender, each about three or four inches long.

Grows amongst bushes, in dry barren uncultivated ground and hedges. Flowers during the hot season.

Every part of this plant is eat by the natives, either raw, or stewed in their curries. The fresh roots taste like a raw turnip, the leaves and the stem like purslane.

8. CEROPEGIA ACUMINATA.

Commoo-manda of the Telingas.

Root perennial, a flattened solid bulb with few fibres from its base.
Stem annual, twining, smooth, jointed.
Leaves opposite, erect, short-petioled, linear, tapering from the base to an acute point, succulent, entire; from two to four inches long, and a quarter or half an inch broad at the base, which is the broadest.
Umbellets lateral, spreading, peduncled, shorter than the leaves.
Flowers, &c. exactly as in C. bulbosa.

Is a native of the same places with the former; flowering time the same. Every part of it is esculent, as in the foregoing.

9. CEROPEGIA TUBEROSA.

Batsala-mandu of the Telingas.

Root, many small tuberous knobs, with thick fleshy fibres; perennial.
Stem twining, herbaceous, annual, round, smooth, jointed, much less succulent than either of the former, from four to twelve feet long.
Leaves opposite, petioled, below hearted, about the middle egged, above oblong; all are a little pointed, waved, entire, smooth, margins coloured, two to three inches long, and one or two broad.
Petiole channelled.
Umbellets lateral, erect, peduncled, longer than the leaves.
Calyx as in the former.
Corol: tube as in C. bulbosa; here the segments of the border either adhere for full half their length, or do not meet; filaments of the nectary clubbed.

This, like the two former, grows in dry uncultivated land amongst bushes: flowers during the same season, and, like the former, every part is esculent; the roots are eat raw, and are more palatable than those of C. bulbosa, though not near so large.

10. CEROPEGIA JUNCEA.

Bella-gada of the Telingas.

Root tuberous, with many ramous fibres.
Stem twining, round, smooth, jointed, succulent.
Leaves very remote, and very small, opposite, sessile, lanced, entire, fleshy.
Umbellets lateral, peduncled, or axillary, erect, few-flowered.
Flowers erect, very large, beautifully variegated with yellow, green, and purple.
Peduncle and Pedicels clubbed.
Calyx as in the former.
Corol: mouth of the tube and border much larger in proportion to the other parts than the last, but in other respects the same.
Nectary nearly the same.
Pistil, &c. the same.

This, like the former, has perennial roots, and an annual stem, is a native of similar places; flowers at the same time; and, like the former, every part of this plant is esculent; eat raw it abates thirst.

11. PERIPLOCA ESCULENTA.

Linn. Suppl. 168.

Oudy-palla of the Telingas.

Root filiform, fibrous.
Stems and *Branches* numerous, twining, round, smooth, running over bushes of considerable size.
Leaves opposite, spreading, short-petioled, linear, tapering to a fine point, rounded at the base, entire, smooth, from four to six inches long, and about three-eighths of an inch broad.
Raceme lateral, long, few-flowered.
Flowers large, beautiful white, with a small tinge of the rose, and striated with purple veins, inodorous.
Nectary and *Stamens* as in Asclepias and Pergularia.
Follicles oblong, inflated.

It is a twining perennial, grows in hedges and among bushes on the banks of water courses, pools, &c. casts its leaves during the dry season; is in flower and foliage during the rainy. On this coast I do not find that the natives ever eat it, nor apply it to any purpose whatever. Cattle eat it. Its elegant flowers render it well deserving of a place in the flower garden.

12. SEMECARPUS ANACARDIUM.

Linn. Suppl. 182.

Nella-jiedy of the Telingas.
Marking-nut of the English.
Anacardium orientale of the Materia Medica.

Trunk very large, straight, high, covered with grey scabrous bark, the bark of the younger parts smooth, light ash-colour; its inner substance contains in crevices a quantity of a white, soft, almost insipid gum.
Branches numerous, spreading.
Leaves about the extremities of the branchlets, alternate, petioled, wedge-form, rounded at the apex, entire, firm, above pretty smooth, below whitish and scabrous, from nine to eighteen inches long, and from four to eight broad.
Petiole one and a half or two inches long, half-round.
Panicle terminal, very large, composed of many simple spikes, that of the male tree much slenderer, but as large or larger.
Bracts many, small, falling.
Flowers numerous, small, of a dirty greenish yellow colour.
Hermaphrodite flowers as in the Supplementum Plantarum.
Pericarp none. *Receptacle* erect, fleshy, pear-shaped, smooth, when ripe yellow, about the size of the nut.
Seed: a single nut, resting upon the receptacle, hearted, flattened on both sides, smooth, shining, black; the cover or the shell of the seed is composed of two laminæ, the inner hard, the outer less so, and leathery; between them are cells which contain the black corrosive resinous juice, which has long made them famous; this juice is of a pale milk colour, till perfectly ripe, when it becomes black.
Male flowers on a separate tree, they are smaller than the hermaphrodite.
Calyx and *Corol*, as in the hermaphrodite.
Filaments five, the length of the petals.
Anthers much larger than in the hermaphrodite.
Pistil none; but in its place a semiglobular hairy glandulous body.

A large tree, bearing male flowers on one, and hermaphrodite on another. It is a native of all the mountainous parts of India. Flowering time July and August. Seed ripe in January and February.

The wood of this tree is reckoned of no use, not only on account of its softness, but also on account of its containing much acrid juice, which renders it dangerous to cut down and work upon. The fleshy receptacles on which the seed rests, are roasted in the ashes, and eat by the natives; their taste is exceedingly like that of roasted apples; before they are roasted, they taste adstringent and acrid, leaving a painful sensation on the tongue for some time. The kernels are rarely eaten.

The green fruit well pounded into a pulp makes good bird-lime. The pure black acrid juice of the shell is employed by the natives externally to remove rheumatic pains, aches, and sprains; a little is well rubbed over the part affected; but in tender constitutions it often produces inflammation and swelling, doing much more harm than good. I think where it has not these disagreeable effects, which is generally the case, it is an efficacious remedy.

It is employed by the Telinga physicians in the cure of almost every sort of venereal complaint; it is prepared as follows: take of this black juice and of the expressed juice of garlic, each one ounce, expressed juice of fresh tamarind-tree leaves, coco-nut oil, and sugar, of each two ounces, mix and boil them for a few minutes; a table spoonful is given to the patient twice a day. I know nothing of the efficacy of this composition myself.

It is universally employed to mark all sorts of cotton cloth; the colour is improved and prevented from running, by a little mixture of quick-lime and water. This juice is not soluble in water, and only diffusible in spirits of wine, for it soon falls to the bottom, unless the menstruum be previously alkalized. The solution is then pretty complete, and of a deep black colour. It sinks in, but soon unites perfectly with expressed oils; alkaline lixivium acts upon it with no better success than plain water.

In the plate the dissected flower is magnified; the fruit of its natural size.

13. CURCULIGO ORCHIOIDES.

Gærtn. sem. 1. *p.* 63. *tab.* 16.

Nalla-tady of the Telingas.

Root tuberous, with many fleshy vermicular fibres.
Leaves numerous, all radical, petioled, sword-form, nerved, slender; when young there are a very few soft white hairs on them, from six to eighteen inches long, and half or three-quarters of an inch broad.
Petiole channelled, below sheath-form, embracing those within.
Raceme solitary, axillary, two-ranked, its apex just appearing above the earth.
Peduncle compressed, clubbed, about an inch long.
Bracts below remote, above nearer, spath-like, pointed, decreasing

in length towards the top, so that their apices are nearly horizontal (corymbe-like) one-flowered.

Flowers pretty large, yellow; the one or two lowermost are hermaphrodite, above all male.

Hermaphrodite flowers below.

Peduncle (of the flower) so long as to elevate the flower above the earth about one inch, hairy, three-sided.

Calyx none.

Petals six, oblong, spreading, withering.

Filaments six, very short.

Anthers linear, erect.

Germ sessile, lanced.

Style very short.

Stigma large, tapering, apex three-cleft.

Capsule, when a germ, shews three cells, with the rudiments of six or eight seeds in each; but when the seeds are ripe, the number is only from one to four, and they seem as if in a transparent fleshy one-celled capsule, and separated by a spongy fleshy substance.

Seeds from one to four, shining, black, beaked.

Male Flowers: Peduncle, Corol, and *Stamen* as above; the *Germ, Style*, and *Stigma* are wanting.*

A native of shady uncultivated places about Samulcotah, though by no means common. In my garden it flowers all the year round.

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14. MIMUSOPS ELENGI.

Linn. Spec. Plant. 497.

Pagadoo of the Telingas.
Magadoo of the Tamuls.
Kunki of the native Portuguese.

Trunk erect, in general from eight to twelve feet to the branches. *Bark* pretty smooth.

Branches exceedingly numerous, spreading, with the extremities ascending, so as to form a most elegant globular, thick head.

Leaves alternate, short-petioled, approximated, declined or depending, waved, very firm, both sides a deep shining green, three to four inches long, and one or one and a half broad.

* Description by Doctor Koenig.

Radix biennis, fusiformis, rugosa, rugis annularibus, cortice fusco tecta, superne squamis scariosis vestita, carnosa, sesquipedalis, crassitie digiti minoris.

Folia radicalia, fasciculatim conferta, erecta et recurvata, quædam terræ incumbentia, linearia, acuta, striata, canaliculata, basi plerumque quinquenervia, punctis minimis densis, pilisque rarioribus longis albis adspersa, pedalia.

Scapus vix supra terram prominulus, angulosus, striatus, albus, squamis scariosis foliisque obvolutus, brevissimus. *Flores* parum supra terram prominuli, fasciculatim conferti, pedunculati. *Pedunculi* erecti, compressiusculi, subalati, basi tenuiores, pilis rarioribus longis albis adspersi, tubo floris breviores, nivei.

Spatha monophylla, lineari-oblonga, acuta, membranacea, striata, pilis rarioribus adspersa, longitudine tubi corollæ, germen involvens.

Corolla monopetala, infundibuliformis. *Tubus* filiformis, pilosus, inanis, niveus. *Limbus* sexpartitus: laciniæ patentes, concavæ, ovato-oblongæ, acutæ, apice barbatæ, extus pallidæ, intus flavæ, pilis brevioribus adspersæ, subcarnosæ.

Filamenta sex, corollæ adnata, patentia, filiformia, vix longitudine styli. *Antheræ* lineari-hastatæ, longitudine filamentorum.

Germen inferum, lineari-oblongum, triquetro-compressum. *Stylus* cum tubo corollæ unitus, extra tubum corollæ adnatus, pyramidalis, basi contractus, sexangularis, angulis marginatis, ciliatis, parum tortuosis, corolla brevior. *Stigma* obtusiusculum.

Capsula subterranea, lineari-oblonga, utrinque acuta, triquetra, leviter striata, bilocularis, vix pollicaris, crassitie pennæ anserinæ, alba. *Semina* 6 ad 8, raro plura, subnidulantia, ovata, compressiuscula, rostrata, rostro obtusiusculo, prominulo.

Stipules small, lanced, concave, rusty, falling.

Peduncles axillary, from one to eight, short, clubbed, bowing, undivided, one-flowered.

Flowers middle-sized, depending, white, very fragrant.

Perianth below, eight-leaved in a double row: leaflets lanced, four exterior leathery and larger, permanent.

Tube of the *Corol* very short, fleshy; border (it may be divided into a double series of segments and a single nectary, or a single series of segments and a double nectary, the first method I shall follow) composed of a double series of segments: the exterior consists of sixteen, spreading; the interior of eight, generally contorted, converging; all are lanced, and a little torn at their extremities.

Nectary eight-leaved, conical, ragged, hairy near the base, inserted alternately with the filaments into the mouth of the tube, converging.

Filaments eight, short, hairy.

Anthers linear, sharp-pointed, below two-parted, converging.

Germ egged, hairy; in it are always the rudiments of eight seeds.

Style awled.

Stigma generally a little ragged.

Berry oval, size and shape of an olive, generally one-seeded.

Seed oval, compressed, smooth, shining, chesnut-coloured.

I have only once found this in its wild state, it was on the mountains in the Rajahmundry Circar, where it grows to be a middle sized tree. On account of its fragrant flowers it is universally planted in the gardens of the natives, as well as in those of all the European nations in India. It flowers chiefly during the hot season.

The flowers are sacred to the Hindoo gods.

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15. MIMUSOPS HEXANDRA.

Palla of the Telingas.

Trunk erect; frequently when old it has large rotten excavations. *Bark* ash-coloured.

Branches numerous, spreading, extremities nearly erect, forming a large shady head.

Leaves alternate, petioled, broad, wedge-form, or inverse-hearted, deeply end-nicked, very hard, both sides a deep shining green, three to five inches long, and one and a half or two broad.

Petiole round, one or one and a half inch long.

Peduncles axillary, from one to six, erect, or spreading, nearly as long as the petiole, clubbed, undivided, one-flowered.

Flowers considerably smaller than the former.

Calyx below, six-leaved, three interior, and three exterior: the exterior are leathery.

Corol one-petaled: tube very short; border like the former, consists of two rows of segments, the exterior twelve, the interior six; all spreading.

Nectary situate between the filaments, as in the former, but spreading, shorter, and more deeply indented.

Filaments six, spreading.

Anthers oval.

Pistil as in the former.

Berry as in the former.

This is a large tree, a native of the mountainous, uncultivated parts of the Circars; is never cultivated, nor seen near culti-

vated places. Flowers during the hot and beginning of the wet season.

The wood is remarkably hard and heavy, for these reasons it is much used by the washermen to beetle their cloth on.

16. CÆSALPINIA SAPPAN.

Linn. Spec. Plant. 545.

Buckan-chitto of the Telingas.
Sappan Wood Tree of the English.

Trunk irregular, the largest twelve feet or more in circumference.
Bark very thin, ash-coloured, that of the branches thickly set with round scabrous tuberosities, each crowned with a small sharp somewhat curved prickle; these drop as the wood becomes large. The young shoots have the prickles, but want their tuberous receptacles.
Branches few, spreading, irregularly armed as above mentioned.
Leaves alternate, abruptly twice feathered, oblong, from twelve to twenty inches long: feathers ten to twelve pair. *Leaflets* opposite, from eight to fourteen pair, somewhat rhomboidal, end-nicked, smooth, three-quarters of an inch long by three-eighths broad.
Petiole common, round, smooth, generally armed with three prickles at the insertion of the feather, the pair below, and the single one above.
Stipules obliquely lanced, falling.
Panicle terminal, large, composed of many simple racemes.
Peduncle and *Pedicels* round and smooth.
Bracts lanced, concave, one-flowered, falling.
Flowers very numerous, pretty large, yellow, without smell.
Calyx as in the genus.
Corol: the four lateral petals equal, the upper (there is none below) small and streaked with red.
Stamen ascending towards the upper coloured petal.
Stigma tubular.
Legume rhomboidal, three inches long, one and three-quarters broad, much compressed.
Seeds three or four, very rarely five, oval, a little compressed, smooth, hard, light brown.

This very valuable tree I lately discovered to be a native of that chain of mountains which separates the Circars from the Berar Rajah's dominions, where it grows to be a very large tree. Flowers during the wet season. Seed ripe in January and February.

This tree is by no means common on this coast, and it is only among the abovementioned mountains that I have found it wild. It is also a native of the south-west frontier of the Bengal province, and probably of many other parts. The markets over India are supplied with wood from Siam, and the Malay countries to the eastward. I have some thousands of young trees about the Company's pepper plantations, which thrive well, and in the course of a few years will be fully as large as what is generally met with at market, although, like others of this nature, the colour of the wood improves by age, and ought therefore to be left till the colour has attained to its utmost degree of perfection. The uses of this wood in dying are numerous throughout Asia; it is an ingredient in the red dye of this coast, commonly called the Chay dye; as may be seen above under the description of Oldenlandia umbellata.

Where a cheap red is required for cotton cloth, this wood is employed by our Telinga dyers, but they cannot make it stand; their general process is as follows; suppose for four yards of bleached cotton cloth. It must be well washed, to take out any remains of the quick-lime, &c. used in bleaching; an infusion of half a pound of powdered caducay in a pint and an half of cold water strained, is employed to prepare the cloth, which is done by wetting it twice in the same infusion, drying it between and after. Next day it is twice wetted in a strong solution of alum, and as often dried in the sun. Next day a decoction of the sappan wood is prepared as follows: take one pound of sappan wood in powder, water twelve quarts, boil it till a third is consumed; divide the remaining eight quarts of the decoction into three parts, one of four, and the other two of two quarts each; into the four quarts put the cloth, wet it well, wring it gently and half dry it; it is again wetted in one of the small portions, and when half dry, wetted for the third and last time in the other remaining portion of the decoction; dry it in the shade, which finishes the process.

This wood seems possessed of nearly the same quality as Braziletto, its infusion and decoction are heightened by alkalies, and destroyed by mineral acids; a solution of tin in aqua regia precipitates from the infusion a beautiful crimson coloured lake; the wood itself is orange coloured, without smell or taste; it gives to spirits a saffron colour.

This tree seems as if it would be a very proper prop for pepper vines to run on. I am now making the trial; should it answer, the cultivation of pepper over these parts of the coast may be rendered exceedingly profitable; for when the vines have done bearing, the sappan wood will have acquired more age, and of course more colour than is generally met with, and will consequently sell for a higher price, probably as much as will defray the expence of the whole culture, and the rent of the land during the time it has been occupied by the pepper vines.

The numerous thorns, with which this tree is covered, render it very proper for high extensive fences, which will afterwards become profitable. It is of a pretty quick growth; in two years from the time the seeds are sown, if in a pretty good soil, they will have attained to the height of eight or ten feet, and begin to flower and bear seed; about the same time the centre part of the stem begins to acquire colour, which yearly improves in quality, as well as increases in quantity.

17. SWIETENIA FEBRIFUGA.

Roxburgh's monography, printed by order of the East India Company.

Swietenia Soymida. *Duncan tent. inaug. de Swietenia Soymida. Edinb.* 1794.
Soymida of the Telingas.

Trunk very straight, rising to a great height, of a great thickness, and covered with a grey, scabrous, cracked bark.
Branches numerous, the lower spreading, the higher ascending, forming a very large shady head.
Leaves alternate, about the extremities of the branchlets, abruptly feathered, about twelve inches long. *Leaflets* opposite, very short, petiolated, three or four pair, oval, obtuse or end-nicked, the lower side generally extending a little further down on the petiolet than the upper, smooth, shining, from three to five inches long, and from two to three broad, the inferior smallest.
Petiole round, smooth, about nine or ten inches long.
Stipules none.

Panicle very large, terminal, diffuse, bearing great numbers of middle-sized, white, inodorous flowers.
Peduncle and *Pedicels* round and smooth.
Bracts very minute.
Calyx below, five-leaved: *Leaflets* oval, deciduous.
Petals five, inverse-egged, obtuse, concave, expanding.
Nectary not quite half the length of the petals, a little bellied: mouth ten-toothed, teeth bifid.
Filaments ten, very short, inserted just within the mouth of the nectary.
Anthers oval.
Germ conical.
Style thick, tapering.
Stigma large, targeted, shutting up the mouth of the nectary.
Capsule egged, large, five-celled, five-valved: valvelets gaping from the top.
Receptacle in the centre, large, spongy, five-angled: angles sharp, and connected with the sutures of the capsule, between them deeply sulcated.
Seeds many in each cell, imbricated, obliquely wedge-shaped, enlarged by a long membranaceous wing, inserted at the upper point of the wing into a long brown speck, on the upper part of the excavations of the receptacle: all the rest of the receptacle is white.

This is a very large tree, a native of the mountainous parts of the Rajahmundry Circar, north of Samulcotah and Peddapore. It flowers about the end of the cold, or beginning of the hot season. Seeds ripen in three or four months after.

The wood of this tree is of a dull red colour, remarkably hard and heavy; it is reckoned by the natives by far the most durable wood they know, on that account it is used for all the wood work in their temples, it is also very serviceable for various other purposes.

The bark is internally of a light red colour; a decoction dyes brown of various shades, according as the cloth has been prepared, &c. Its taste is a bitter and adstringent conjoined, and very strong, particularly the bitter, at the same time not any way nauseous or otherwise disagreeable, for the bitter, although strong, is rather more palatable than most others I have tasted.

In the plate the dissected flower is magnified; the fruit of its natural size.

18. GÆRTNERA RACEMOSA.

Gærtnera. *Schreb. gen.* 735.
Molina racemosa. *Cavanill. monad. p.* 435. *t.* 263.
Hiptage Madablota. *Gærtn. sem.* 2. *p.* 169. *t.* 116.
Madablota. Banisteria tetraptera. *Sonnerat voyage aux Indes,* 2. *p.* 238. *tab.* 135.
Banisteria unicapsularis. *Lamarck encycl.* 1. *p.* 367.
Banisteria benghalensis. *Linn. spec. plant.* 611.
Vedal-chittoo of the Telingas.

Trunk and *Branches* climbing. *Bark* covered with light coloured scabrous dots.
Leaves opposite, short-petioled, oblong, waved, pointed, entire, smooth, shining; small glands round the under edge of the margin, and two larger at its termination in the petiole, about four to six inches long and two broad.
Raceme terminal, though sometimes from the exterior axills, corymbe-like while flowering.

Pedicels jointed at the middle, and three-bracted.
Bracts, a small acute one under the insertion of each pedicel, and another smaller at the joint
Flowers large, nearly white, very beautifully fringed and waved, very fragrant.
Calyx below, five-leaved, or to the base five-parted: *Leaflets* oblong, permanent; there is only one gland on the whole calyx, it is large, oblong, smooth, elevated, chesnut-coloured, placed partly on the two upper leaflets, and partly on the pedicel, permanent.
Petals five, unequal, irregular, claws short, they are totally reflected back towards the raceme: the lower two are oval; the next two lateral above orbicular; the superior petal broader, lies back over the rest, is beautifully tinged with yellow in the middle; all are most beautifully fringed round the margin.
Filaments ten, of which the lower one is twice the length and thickness of the rest; all are ascending.
Anthers egged, equal.
Germs three, united as it were into one three-lobed body.
Style single, ascending, about as long as the large stamen.
Stigma simple, incurved.
Capsules, from one to three, globular, size of a large pea, one-celled, one-valved, not opening, each is enlarged with three unequal spreading, membranaceous, wedge-shaped, obtuse wings, besides a small erect one in the centre.
Seed single, globular, affixed to the bottom of the capsule.

It is a large climbing woody shrub, a native of the Circar mountains. Flowering time the wet and cold season. It is cultivated in our gardens all over the coast, on account of the beauty and fragrance of its flowers.

19. BASSIA LATIFOLIA.

Máhwah Tree. *Transact. of the Society of Bengal, vol.* 1. *p.* 300.
Ipie of the Telingas.
Illipay of the Tamuls.
Oil Tree of the English.

Trunk straight, but short, covered with smooth ash-coloured *Bark*.
Branches very numerous; the lower spreading horizontally.
Leaves alternate, petioled, crowded about the extremities of the branches, oblong, rigid, smooth above, below somewhat whitish, from four to eight inches long, and from two to four broad.
Petiole round, about an inch long.
Stipules none.
Flowers numerous, crowded from the extremities of the generally naked branchlets, peduncled, at all times bowing (bent, with the mouth of the flower directly to the ground).
Peduncles about an inch long, round, thickened, covered with rust-coloured down.
Calyx as in the genus.
Corol: tube as in the genus; border from seven to fourteen-parted.
Stamen, Pistil, and *Drupe* as in the genus.
Seeds from one to four, generally one or two, oblong, pointed at the lower end.

Is of a middling size, a native of the mountainous parts of the coast; casts its leaves during the cold season, they appear again

with the flowers in March and April. Seed ripe in July and August.

This is a very useful tree; the wood is hard, very strong, and proper for naves of wheel-carriages, &c.

The flowers are eat raw by the natives of the mountainous parts of the Circars; the jackals also eat them. They have a sweet spirituous taste, and a spirit, which is strong and intoxicating, is distilled from them by the hill people. The seeds yield a large quantity of oil by expression, but it is thick, and of a quality inferior to castor oil, and used only by the poorer people to burn.

On the apices of the flowers, before they open, there is frequently a drop of a whitish, soft, tasteless resin to be found.

20. DILLENIA PENTAGYNA.

Rawadam of the Telingas.

Trunk erect, very large.
Branches numerous, ascending.
Leaves alternate, petioled, about the extremities of the branchlets, oblong, pointed, sharp-sawed, having large elevated parallel veins, smooth, shining, except when very young, then downy, from twelve to twenty inches long, and from four to six broad.
Petiole about two inches long, deep channelled, embracing the branchlets, leaving a permanent mark when it falls off.
Peduncles collected in bundles from tuberosities over the naked woody two or three years old branchlets, erect, round, smooth, two inches long, undivided, one-flowered.
Bracts no other than the rust-coloured downy scales that surround the insertion of the peduncles.
Flowers middle-sized, yellow.
Calyx as in the genus.
Petals oblong, or lanced.
Filaments many, of which the interior ten are twice the length of the rest.
Anthers sword-shaped: those of the short or exterior filaments are erect; of the long filaments twice the size of the others, and spread out over them in form of a star.
Germs five.
Styles five, short.
Stigmas lanced, spreading.
Pericarp pendulous, size of a small nutmeg; the firm, fleshy leaflets of the calyx (here not increased in size) surround and entirely inclose five small soft capsules, which contain a soft transparent gluten.
Seeds reniform, few come to maturity, generally one, rarely two, in each capsule.

This tree is a native of the valleys far up among the mountains; it flowers in March and April.

In the plate the dissected flower and germ are magnified; the fruit of its natural size, when ripe; the seed magnified.

21. BUTEA FRONDOSA.

Erythrina monosperma. *Lamarck encycl.* 2. *p.* 391.
Plaso. *Rheed. mal.* 6. *p.* 29. *tab.* 16, 17.
Maduga of the Telingas.

Trunk irregular, generally a little crooked, covered with ash-coloured, spongy, thick, slightly scabrous *Bark*, the middle strata of which contain a red juice, hereafter to be mentioned.
Branches very irregularly bent in various directions; young shoots downy.
Leaves alternate, spreading, three'd, from eight to sixteen inches long. *Leaflets* emarginated, or rounded at the apex, leathery, above shining and pretty smooth, below slightly hoary, entire; the lateral are obliquely oval, from five to seven inches long, and from three to four and a half broad; the terminal inverse-hearted, or in other words, transversely oval, and considerably larger than the lateral.
Common Petiole round, when young downy, length of the leaflets. *Stipules* of the petiole small, recurved, downy; of the leaflets awled.
Racemes terminal, axillary, and from tuberosities over the naked woody branchlets, rigid, covered with a soft, greenish-purple-coloured down.
Flowers papilionaceous, pendulous, numerous, pediceled, large, their ground colour a beautiful deep red, shaded with orange and silver-coloured down, which gives them a most elegant appearance.
Pedicels round, about an inch long, articulated near the apex, and covered with the same greenish velvet-like down.
Bracts, one below the insertion of each pedicel, lanced, falling; two similar but smaller, pressing on the calyx, falling also.
Calyx belled, leathery, two-lipped: upper lip large, scarce emarginated; under lip three-toothed, covered with the same dark green down that the raceme and pedicels are covered with, withering.
Corol. *Banner* reflected, egged, pointed, very little longer than the wings. *Wings* ascending, lanced, length of the keel. *Keel* below, two-parted, ascending, large, mooned, length of the wings and banner.
Filaments one and nine, ascending in a regular semicircle, about as long as the corol.
Anthers equal, linear, erect.
Germ short, thick, pediceled, lanced, downy.
Style ascending, a little larger than the filaments.
Stigma small, glandulous.
Legume pediceled, large, pendulous, all but the apex, where the seed is lodged leafy, downy, about six inches long, by two broad, never opens of itself.
Seed one, lodged at the point of the legume, oval, much compressed, smooth, brown, from one and a quarter to one and a half inch long, and about one broad.

This is a middle sized, or rather a large tree, not common on the low lands of this coast, but very common among the mountains; casts its leaves during the cold season; they come out again with the flowers about the months of March and April; seed ripe in June and July.

From natural fissures, and wounds made in the bark of this tree, during the hot season, there issues a most beautiful red juice, which soon hardens into a ruby-coloured, brittle, astringent gum; but it soon loses its beautiful colour if exposed to the air. To preserve the colour, the gum must be gathered as soon as it becomes hard, and closely corked up in a bottle.

This gum held in the flame of a candle swells, and burns away slowly, without smell or the least flame, into a coal, and then into fine light white ashes; held in the mouth it soon dissolves, it tastes strongly but simply astringent; heat does not soften it, but rather

renders it more brittle. Pure water dissolves it perfectly, and the solution is of a deep, clear, red colour. It is in a great measure soluble in spirits, but the solution is paler and a little turbid; the watery solution also becomes turbid when spirit is added, and the spirituous more clear by the addition of water; diluted vitriolic acid renders both solutions turbid; mild caustic vegetable alkali changes the colour of the watery solution to a clear, deep, fiery, blood red;* the spirituous it also deepens, but in a less degree; sal martis changes the watery solution into a good durable ink.

These are, I think, proofs that it contains a very small proportion of resin; in which it differs from the gum resin called Kino, or gummi rubrum astringens Gambiense, which the Edinburgh college has taken into their Materia Medica (I have used the recent gum in making my experiments, which may make some difference), but as this can be most perfectly dissolved in a watery menstruum, it may prove of use where a spirituous solution of Kino (being the most complete) cannot be properly administered, consequently it may prove a valuable acquisition.

Infusions of the flowers, either fresh or dried, dye cotton cloth, previously impregnated with a solution of alum, or alum and tartar, a most beautiful bright yellow, more or less deep according to the strength of the infusion: a little alkali added to the infusion changes it to a deep redish orange, which dyes unprepared cotton cloth of the same colour, but the least acid changes it to a yellow, or lemon. These beautiful colours I have not been able to render perfectly permanent.

Among numberless experiments, I expressed a quantity of the juice of the fresh flowers, which being diluted with alum water, and rendered perfectly clear by depuration, was then evaporated by the heat of the sun, into a soft extract; this proved a brighter water colour than any gamboge I have met with; it is one year since I first used it, and it remains bright. Infusions of the dried flowers yielded an extract very little, if any thing, inferior to this last mentioned; they yield also a very fine, durable, yellow lake, and all these in a very large proportion.

The Lac insects are frequently found on the small branches and the petioles of the leaves of this tree. Whether the natural juices of its bark contribute to improve the colour of their red nidus (colouring matter) I cannot say; to determine it, would require a set of experiments accurately made on specimens of lac gathered from the various trees it is found upon, at the same time, and as nearly as possible from the same place.

I do not find that the natives make any use of the gum or flowers, although they promise to be valuable; the former as a medicine, and the latter as a pigment and dying drug.

22. BUTEA SUPERBA.

Tiga Maduga of the Telingas.

Root spindle-form, very large.

Stem twining, as thick or thicker than a man's leg, woody, very long, running over large trees. *Bark* ash-coloured, pretty smooth.

Branches like the stem but small, and with a smoother bark.

Leaves alternate, three'd, remote, very large. *Leaflets* downy, in

* With an alkalized decoction of this gum, I tried to dye cotton cloth prepared with alum, with sugar of lead, and with a solution of tin in aqua regia, but the reds produced thereby were bad; that where alum was employed was the best.

other respects as in Butea frondosa, but greatly larger, the terminal one is generally about twenty inches long, and broad in proportion; the lateral somewhat less.

Racemes as in the former, but much larger.

Flowers also the same, only much larger and more numerous.

Calyx divided as the other, but the divisions longer and much more pointed.

Corol the same.

Legume and *Seed* as in the former, but rather larger.

This is a very large twining shrub, a native of the mountains. Flowering time the beginning of the hot season.

When this species is in full flower, I do not think the vegetable world offers a more gaudy show. The flowers are incomparably beautiful, very large, and very numerous; the colours are so exceedingly vivid, that my best painter has not been able with his utmost skill to imitate their brightness.

From fissures in the bark, the same sort of ruby-coloured astringent gum exsudes, the flowers also yield the same beautiful yellow dye and pigment.

23. AILANTHUS EXCELSA.

Pedda-maunchitto of the Telingas.

Trunk perfectly straight, rising like that of the fir-tree to a very great height. *Bark* smooth, ash-coloured.

Branches pretty numerous, ascending.

Leaves about the extremities of the branchlets, abruptly pinnated, generally about three feet long. *Leaflets* short-petiolated, from ten to fourteen pair, obliquely oblong, or somewhat sickle-form, the nerve runs so as to make the exterior portion twice as broad as the interior, very remotely and grossly serrated, or indented, smooth, about four inches long and two broad.

Petiole round, smooth.

Panicle terminal, very large.

Bracts minute.

Flowers exceedingly numerous, small, slightly tinged with yellow, hermaphrodite and male mixed.

HERMAPHRODITE FLOWERS.

Calyx as in the genus.

Petals five, many times larger than the calyx.

Nectary or *Receptacle* is a perforated, glandulous, notched body, which surrounds, and in a great measure hides, the germs.

Filaments ten, shorter than the petals, inserted into the lower edge of the nectary.

Germs above, from one to four, very minute, immersed in the perforation of the nectary.

Style none.

Stigma small.

Capsules from one to four, but generally one or two, not connected at the base, linear-oblong, surrounded with a large membranaceous wing, a little twisted at the apex and base.

Seed one, flattened.

MALE FLOWERS.

Calyx, Corol, Nectary, and *Stamens* as in the hermaphrodite, but no rudiment of a pistil.

This is an immense large tree, is found in many parts of the Circars, but is chiefly a native of the open valleys among the

mountains; flowers during the cold season; seed ripe in April and May.

The wood of this tree is white and light, of course it soon perishes; is chiefly used to make cattamarans (rafts for fishermen to go a fishing on).

In the plate the dissected flowers are magnified; the fruit of its natural size.

24. STERCULIA URENS.

Cavallie of the Telingas.

Trunk erect, very straight; top large and shady. *Bark* ash-coloured, very smooth; its outer coat is thin, transparent, covered with a farinaceous substance, and peels off like the pellicle of the birch-bark; inwardly it is fibrous and netted.

Leaves about the extremities of the branches, alternate, petioled, five-lobed, five-nerved: lobes acute, very downy, from nine to twelve inches each way.

Petiole nearly as long as the leaf, round, downy.

Panicles terminal, pretty large; every part covered with a glutinous, farinaceous, yellow down.

Bracts lanced.

Flowers small, numerous, yellow, male and hermaphrodite mixed; there is but a small proportion of the latter.

HERMAPHRODITE FLOWERS.

Calyx below, belled, five-toothed, leathery, divisions acute; on the inside of each division near the base there is an inverse-hearted hairy gland.

Corol none.

Filaments ten, short, alternately longer, united below into a thin sheath, which girds the base of the germs.

Anthers large, two-lobed, alternately larger.

Germs five, placed on a thick short pedicel.

Style single, short, thick.

Stigma five-lobed.

Capsules five, leguminous, united in form of a star, one-celled, one-valved, opening lengthways, on the outside covered with yellow down, and many stiff burning hairs.

Seeds from three to five, oblong, chesnut-coloured, inserted alternately into the margins of the capsules.

MALE FLOWERS.

Calyx, *Stamen*, and columnar *Receptacle* as in the hermaphrodite.

Pistil: the rudiments of the germs only, without any appearance of a style.

This is a very large tree, chiefly a native of the mountainous countries on the coast; casts its leaves about the end of the wet season; flowers during the cold; the leaves come out with the fruit about the beginning of the hot season.

The wood of this tree is soft and spongy; towards the centre of large trees it is reddish. I do not know of any use it is put to, except to make Hindoo guitars.

I observed that the water in which I kept green branches for examination, became thick, like a clear, glutinous jelly.

Bark exceedingly astringent, tinges the saliva reddish. Seeds are roasted and eaten by the natives; they taste very like parched pease.

25. STERCULIA COLORATA.

Caraka of the Telingas.

Trunk erect, growing to a very great size. *Bark* ash-coloured, and a little scabrous.

Branches numerous, irregularly spreading; *Bark* as on the trunk, but smoother.

Leaves alternate, about the extremities of the branchlets, petioled, considerably broader than long, five-nerved, five-lobed: lobes acute; soft and a little downy; they are generally, when full grown, from nine to twelve inches broad, and from six to nine long.

Petiole round, a little downy, about nine inches long.

Stipules two, erect, lanced, inserted into the petiole near its base.

Panicles terminal, small, numerous, red like coral, covered with many red stellated hairs: when in flower this tree appears as if entirely covered with fine ramifications of red coral.

Flowers numerous, about an inch long.

Calyx below, funnel-form, leathery, its mouth five-toothed, outside covered with red stellated hairs, withering.

Corol none.

Filaments scarce any.

Anthers about thirty, kidney-form, sitting sessile round the border of the extremity of the receptacle.

Receptacle of the pistil cylindric, bent a little, length of the calyx, round, smooth, bearing five oval germs on its top.

Styles short, recurved.

Stigmas acute.

Capsules from one to five come to maturity, leguminous, pedicelled, pendulous, leathery, one-celled, one-valved, opening on the outside long before the seeds are ripe.

Seeds two, adhering one to each margin of the gaping capsule, alternate, about the size and shape of a French bean.

This is a very large tree, a native of the mountainous parts of the Rajahmundry Circar; casts its leaves during the cold season; flowers in April; soon after the leaves make their appearance.

26. SALVADORA PERSICA.

Linn. Spec. Plant. 178. *Vahl Symb.* 1. *p.* 12. *tab.* 4.

Embelia Grossularia. *Retz. obs.* 4. *p.* 24.
Pedda Waragowenky of the Telingas.

Trunk generally crooked, eight or ten feet high to the branches, and one in diameter. *Bark* very scabrous and deeply cracked.

Branches exceedingly numerous, spreading, with their extremities perfectly pendulous, like the weeping willow.

Leaves opposite, petioled, oval or oblong, entire, very smooth and shining on both sides, without veins, from one to two inches long, and about one broad.

Stipules none.

Panicle terminal, and from the exterior axills, composed.

Flowers minute, very numerous, greenish yellow.

Bracts minute.

Calyx below, four-toothed, lasting.

Corol one-petaled: tube short; border four-cleft; segments oblong, revolute.

Filaments four, inserted below the divisions of the corol, and rather shorter than them.
Anthers oval.
Germ globular.
Style none.
Stigma scabrous.
Berry very minute, much smaller than a grain of black pepper, smooth, red, juicy.
Seed one.*

This is a middle sized tree, a native of most parts of the Circars, though by no means common; it seems to grow equally well in every soil; flowers and bears ripe fruit all the year round.

The berries have a strong aromatic smell, and taste much like garden-cresses.

The bark of the root is remarkably acrid; bruised and applied to the skin it soon raises blisters, for which purpose the natives often use it; as a stimulant it promises to be a medicine possessed of very considerable powers.

27. ARDISIA SOLANACEA.

Conda Mayoor of the Telingas.

Trunk one or more from the same root, erect. *Bark* ash-coloured.
Leaves alternate, short-petioled, oval, pointed, entire, smooth, glossy, somewhat succulent, from four to six inches long, and from two to three broad.
Raceme corymbe-like, axillary, shorter than the leaf.
Peduncle round, smooth.
Pedicels clubbed, round, smooth.
Bracts, a concave one below each pedicel.
Flowers pretty large, rose-coloured.
Calyx below, five-leaved: *Leaflets* imbricated, concave, roundish, lasting.
Corol one-petaled: tube exceedingly short; border five-cleft: divisions spreading, hearted.
Filaments five, exceedingly short, from the bottom of the tube.
Anthers oblong, acute.
Germ oblong.
Style awled.
Stigma acute.
Berry size of a small cherry, round, juicy, black, one-seeded.

* Description by Doctor Koenig.

Ramuli oppositi, teretes, glabri, nitidi, articulati, ad articulos compressiusculi, et linea transversali prominula a stipulis caducis utrinque notati, flaccidi, penduli, longi.

Folia opposita, pendula, petiolata, lanceolato-oblonga, obtusa cum acumine, integerrima, margine calloso, utrinque glabra, nitida, nervosa, rigida, subcarnosa. *Petioli* patentes, filiformes, glabri, vix longitudine tertiæ partis folii.

Flores ad apices ramorum axillares, racemosi. *Racemi* paniculati, trichotomi. *Bracteæ* oppositæ, sessiles, oblongæ, membranaceæ, caducæ.

Calyx monophyllus, campanulatus, quadridentatus: denticulis patentibus, rotundatis, lacero-ciliatis; glaber, membranaceus, persistens.

Corolla monopetala, campanulata, glabra, membranacea, quadrifida: laciniæ reflexæ, ovatæ, acutæ, marginibus revolutis, pilis minimis adpressis viridibus adspersæ; calyce duplo major, viridi-flavicans, persistens.

Filamenta quatuor, infra lacinias corollæ adnata, patentia, brevia. *Antheræ* oblongæ, parvæ, virides.

Germen superum, globosum, glabrum. *Stylus* vix ullus. *Stigma* hypocrateriforme, perforatum.

Bacca globosa, carnosa, pellucida, rubra, fertilis magnitudine pisi minoris. *Semen* unicum, globosum, viridi-fuscum, magnitudine piperis albi. Baccæ steriles coloris elegantioris et magis pellucidæ sunt.

A small tree, or large shrub; a native of moist places in the valleys among the mountains.

The juice of the berries is of a very beautiful bright red colour; upon paper it changes to a durable brown.

28. SIDEROXYLON TOMENTOSUM.

Trunk erect. *Bark* ash-coloured.
Branches erect, very numerous.
Leaves alternate, short-petioled, oval, a little scolloped; when full grown smooth, when young covered with much rust-coloured down, from three to five inches long, and one and a half broad.
Peduncles axillary, numerous, short, downy, bowing, undivided, one-flowered.
Flowers small, dirty white.
Calyx below, five-leaved: leaflets imbricated, downy, permanent.
Corol one-petaled: tube short, inside downy, margin five-parted: segments spreading, half-lanced, acute, waved.
Nectary: five petals alternate with the filaments, waved, length of the stamens.
Stamens five.
Berry oval, size of an olive.
Seed generally one or two, though there are the rudiments of five.

A small tree, a native of the tops of the mountains chiefly; flowers during the hot season.

29. BUTTNERIA HERBACEA.

Leaves alternate, petioled, hearted, sawed, downy, two and a half inches long, and one and a half broad.
Stipules reflex, small, acute.
Peduncles axillary, one or more, three-flowered.
Leaflets of the calyx large, reflex.
Nectary one-leaved, five-toothed: teeth converging over the pistil.
Filaments five, very short, from the fissures of the nectary, reflex.
Anthers double, singly oval, the rest as in the genus.

An erect herbaceous plant, a native of the tops of the mountains.

30. STAPELIA ADSCENDENS.

Car-allum of the Telingas.

Root fibrous.
Stems several, perennial, succulent, about a foot or two high, at the base they rest on the ground, and strike root; above erect, four-sided: angles blunt, notched.
Branches erect, like the stems.
Leaves alternate, sessile, on the angles of the branches, lanced, very minute.
Flowers axillary, about the extremities of the branches, peduncled, generally single, erect, small, variegated with dark purple and yellow.
Calyx to the bottom five-cleft: divisions lanced.

Corol: tube scarce any; border flat: divisions linear, margins reflected.
Follicles erect, as thick as a goose-quill, about four or five inches long.

This plant is not very common; it grows among bushes on high, dry, barren ground; flowers during the wet season. The natives eat raw the most succulent tender branches, although they are bitter and salt to the taste.

31. GRISLEA TOMENTOSA.

Lythrum fruticosum. *Linn. Spec. Plant.* 641.
Seringie of the Telingas.

Stem and principal branches erect; smaller ascending; bark rust coloured.
Leaves opposite, two-faced, sessile, half-lanced with a hearted base, acute, above smooth, below whitish.
Raceme axillary, short, bearing from five to fifteen flowers.
Flowers pretty large, red coloured, permanent.
Calyx red, six-toothed, equal, permanent, as is also the colour.
Corol: petals six, small, lanced.
Filaments equal, inserted in the calyx near its base.
Stigma oblong.
Capsule covered with the coloured permanent calyx.

A very beautiful flowering shrub, a native of the hills and valleys through the northern provinces. Flowers during the cold, and beginning of the hot season.

The bright red calyx, which retains its colour till the seeds are ripe, gives to this shrub a very showy appearance. I do not know any use it is applied to.

32. ROXBURGHIA GLORIOSOIDES.

Canipoo-Tiga of the Telingas.

GENERIC CHARACTER.

Calyx four-leaved. *Corol* four-petaled, inwardly keeled. Nectarial bodies four, awled, on the apex of the keel of the petals, converging. *Anthers* linear, sessile, in the grooves of the keel. *Capsule* one-celled, two-valved.

DESCRIPTION.

Root perennial, composed of many smooth, cylindric, fleshy tubers, from six to twelve inches long, and from three to five in circumference about the middle; they taper equally towards each end.
Stem biennial or more, twining, smooth, from six to twenty feet long, running over small trees, &c.
Branches like the stem, but few and slenderer.
Leaves sometimes alternate, sometimes opposite, petioled, nearly depending, hearted, fine-pointed: point recurvate, entire, smooth, shining, in substance soft and delicate, generally eleven-nerved, with beautiful, very fine, transverse veins running between the nerves; about four or six inches long, and three or four broad.

Petiole slightly channelled, smooth; one and a half or two inches broad.
Peduncle axillary, single, erect, length of the petiole, generally two-flowered.
Pedicels clubed, short.
Bract one, lanced, at the base of the pedicels.
Calyx below, four-leaved: leaflets lanced, membranaceous, striated, coloured, revolute, placed immediately below the petals.
Petals four, nearly erect, lanced; the lower half is rather broader than the upper, and along its inside runs a deep, sharp, slightly waved keel, which forms on each side of it a deep groove or hollow; the four keels converge, and in some measure adhere together, which brings the sides of the petals close, forming like a tube; the upper part of the petals is narrow, bending out a little, then their points bend in.
Nectary is composed of four, lanced, yellow bodies, each sitting sessile on the apex of the keel of the petals, converging into one conical body.
Filaments none.
Anthers eight, linear, lodged in the grooves formed by the keel of the petals, adhering their whole length, but their chief insertion is near the base.
Germ above, hearted.
Style none.
Stigma pointed.
Capsule egged, compressed, one-celled, two-valved, opening from the apex; is about an inch and a half long, and one broad.
Seeds from five to eight, inserted by pedicels into the bottom of the capsule, cylindric, striated: the pedicels are surrounded with numerous, small pellucid vesicles.

OBSERVATIONS.

This is a native of moist valleys among the mountains; its flowering time the cold season.

33. UVARIA CERASOIDES.

Duduga of the Telingas.

Trunk erect, long, and perfectly straight.
Branches spreading, horizontal: branchlets two-faced.
Leaves alternate, two-faced, short-petioled, lanced, or oblong, pointed, below downy, entire; about four inches long, and one and a half broad.
Stipules none.
Peduncle axillary, simple, bowing, bracted near the base, one-flowered, round, downy; about one inch long.
Calyx three-leaved.
Corol six-petaled, &c. as in the genus.
Filaments very numerous, short, clubed, grooved, fleshy, ascending, placed so very close as to press upon one another, inserted into a globular fleshy receptacle.
Anthers four or five-sided, lop'd, a little concave in the centre.
Germs about forty, occupying the disk or centre, oblong, sessile, hairy.
Styles short.
Stigmas large, purple.
Berries many, pediceled, diverging, umbell-like, globular, size of a small cherry, and very like one when ripe; one-celled.
Seed one, round, like the berry.

This is a large tree, a native of the mountainous inland parts of the Circars; does not cast its leaves; flowers during the hot season.

The wood of this species is employed for many purposes by the natives; Europeans do not know it. The berries are eaten by the natives when ripe, and are pretty good, but rather too astringent.

34. UVARIA SUBEROSA.

Chilcka duduga of the Telingas.

Trunk remarkably straight. *Bark* scabrous, very deeply split in various directions.
Branches horizontal, two-faced.
Leaves alternate, two-faced, short-petioled, oblong, waved, both sides smooth, deep-shining green; from two to three inches long, and about one and one and a half broad.
Peduncles opposite (leaf-opposed), single, bowing, one-flowered.
Calyx may be said to be six-leaved, and the *Corol* three-petaled, as only the interior three of the nine are coloured, coral-like.
Stamens as in U. Cerasoides.
Berries numerous, as in the former, only when ripe, black.
Seed one, shape of the berry.

This species is much more common than the former, though it seldom acquires the size of a tree, except among the mountains. It is in flower and fruit all the year, and does not cast its leaves.

The wood of this species is more useful than that of the former; it is of a chocolate colour, durable, and very elastic.

35. UVARIA TOMENTOSA.

Trunk straight, of considerable height and size.
Branches numerous, horizontal, forming a very large shady head. *Branchlets* two-faced, alternate.
Leaves alternate, two-faced, short-petioled, oblong, or oval, very downy, soft, entire; from two to three inches long, by one and two broad.
Stipules none.
Peduncles scattered, generally single, bowing, slender, woolly, half the length of the leaf, one-flowered.
Calyx and *Corol* as in U. suberosa.
Filaments numerous, very short, not club'd.
Anthers oblong, twin.
Germs as in the other, glutinous.
Berries size of a large nutmeg, round, downy, pulpy, dark purple when ripe.
Seeds generally four, nidulant, kidney-form, size of a french bean.

A large tree, a native of the Circar mountains; flowers during the hot season.

36. UVARIA LUTEA.

Muoy of the Telingas.

Trunk as in the others, remarkably straight. *Bark* dark coloured, pretty smooth.
Leaves horizontal, two-faced, short-petioled, oblong or oval, very smooth, shining, firm, waved, entire, about three inches long, and one and a half broad.
Peduncle generally leaf-opposed, very short; from one to six-flowered.
Flowers a dirty greenish rust-colour, short-pediceled.
Calyx three-leaved, small.
Corol six-petaled, four or five times larger than the calyx.
Filaments very short.
Anthers oblong, pointed.
Germs from four to six.
Berries from four to six, short pediceled, placed in form of a star round their receptacle for a common centre; size of a partridge's egg, oval, smooth, pulpy, and, when ripe, of a bright yellow.
Seed about six in each berry, kidney-form, nidulant.

This is also a pretty large tree, and grows only among the mountains; its flowering time is in the hot season. It does not cast its leaves.

37. ORCHIS PLANTAGINEA.

Bulb perennial, generally single, undivided, egged, villous, size of a pigeon's egg; a few fungous, villous fibres issue from the base of the scape, near its insertion into the top of the bulb.
Leaves from four to eight, radical, pressing on the earth, broad-oval, smooth, deep shining-green, somewhat fleshy, many-nerved; about four inches long, and three broad.
Scape erect, about a foot or a foot and a half high, including the flower-bearing part; about as thick as a goose-quill, round, smooth; at every inch and a half, or two inches, there is a lanced leafy sheath.
Spike four to six inches long, every where surrounded with flowers.
Flowers numerous, single, bracted, white, fragrant.
Bracts single, one-flowered, lanced, nerved, as long as the germ.
Corol: three exterior petals, nearly equal; two interior, small, obliquely oblong, erect.
Nectary: upper lip short; under lip three-parted; middle division long, narrow, pointed, recurvate.
Horn nearly twice the length of the germ, perpendicular, or nearly so.

A native of moist valleys among the hills; flowering time the rainy season.

38. LIMODORUM VIRENS.

Bulbs many, connected near the base, conical, pointed, surrounded with the circular marks of the insertions of the leaves, greenish, apexes generally above ground, many fleshy fibres issue from the base.
Leaves all radical, several, linear, slightly nerved, nearly the length of the scape, about an inch broad, smooth.

Scape axillary, erect, often branchy, from one to two feet high, round, smooth, coloured with purple spots; here and there a sheathed, acute bract.
Flowers remote, striated, greenish-yellow.
Bracts acute, short, one-flowered.
Petals nearly equal, erect, or ascending.
Nectary: under lip projecting, broader, but shorter than the petals, laterally lobed: lobes involute: middle division large, hearted, fringed.

Is a native of dry, uncultivated ground; flowers during the cold season.

39. LIMODORUM RECURVUM.

Bulbs perennial, striated, nearly round, surrounded with one or two rings; many thick, fleshy fibres, from their lower parts.
Stem, (if it can be so called) from the side or base of the bulb; but it is no other than the vaginated petioles of the three or four leaves united, and enveloped with two or three abrupt sheaths, scarcely appearing above the ground.
Leaves broad-lanced, five-nerved, in substance slender, a little waved round the margins, smooth, from six to twelve inches long, and three or four broad.
Scape from the same part of the bulb with the stem, and even sometimes involved in the lowermost sheath or two of the scape, bending to one side for a short way, then nodding; about six inches long, or rather less than half the length of the leaves; a few sheaths surrounding it here and there.
Spike globular, apex looks straight to the ground; many-flowered.
Bracts sessile, straight, lanced, one-flowered.
Flowers numerous, crowded, white, with a small tinge of yellow.
Petals nearly equal.
Nectary: under lip broad: apex rounded, undivided, shovel-form, crenulated.
Horn scarcely any.

A native of moist valleys among the hills; flowering time the beginning of the rains.

I have raised it in my garden for several years, where the leaves remain most part of the year.

40. LIMODORUM NUTANS.

It differs from the Limodorum recurvum in the following respects:
Here the *Bulbs* are smooth; there striated.
Here the *Leaves* are oval; there lanced.
Here the *Scape* is longer than the leaves; there not half so long.
Here the *Spike* is oblong and pendulous; there globular and rigidly recurved.
Here the *Flowers* stand at some distance from one another; there they are crowded.
Here they are a beautiful rose colour; there white.
Here the under lip of the *Nectary* is sharp-pointed; there circular, and crenulated.

It is a native of the same places with the last; flowering time the same.

41. LIMODORUM APHYLLUM.

Roots fibrous, adhering in a tuft to rocks, &c.
Stems perennial, several, most simple, spreading, or pendulous, as the situation admits, naked, round, jointed at every inch, and at each joint small, membranaceous, annular squamæ, without the least vestige of a leaf.
Flowers sessile, (unless the germ is called a peduncle) generally single, issuing from the joints of the stems.
Nectary large, near the base, the sides incurved, so as to form (as it were) a tube, the exterior part expanded, margins curled, waved, and ciliated; it is of a pale sulphur colour.

This is a very rare plant; a native of dry rocky hills. I brought it into my garden, and planted it in as dry a barren spot as I could find, but it lived only till the first rains fell. It flowers the beginning of the hot season.

42. EPIDENDRUM TESSELLATUM.

Roots several, simple, or branchy, thick, smooth; long, contorted, fibres issuing from the lower, naked part of the stem, and from among the lower leaves, adhering firmly to the bark of the tree.
Stem perennial, simple, one or two feet long, as thick as the little finger, crooked, upper part covered with leaves, lower naked, withering away at the lower extremity.
Leaves approximated, imbricated, alternate, two-faced, linear, channelled, fleshy, smooth, very firm, extremities two-three-toothed; from six to nine inches long, and about one broad.
Raceme axillary, naked, length of the leaves, flower-bearing part winding, few-flowered.
Flowers from five to ten, remote, two-faced, beautifully waved and striated, with various shades of a greenish-yellow.
Petals oval, spreading, equal, scolloped.
Nectary length of the petals, about the middle its sides approach, forming a tube: apex somewhat pointed.

This is a very beautiful perennial parasite, found adhering to the trunks and branches of trees among the Circar mountains; flowers during the wet season.

43. EPIDENDRUM PRÆMORSUM.

Thalia maravara. *Rheed. mal.* 12. *p.* 9. *tab.* 4. (quoted by Linnæus for Epidendrum furvum, but very different from Angræcum furvum of *Rumphius.*)

Root and *Stem* the same.
Leaves remote, alternate, two-faced, linear, channelled, smooth, very firm, end-bitten, jointed just above their sheath-like base; about six inches long, and one broad.
Spike before the leaf, or leaf-opposed, short, straight, thick, many-flowered.
Bracts small, triangular, one-flowered.
Flowers surround every part of the spike, small, variegated with red and yellow.

This is also a parasite, and grows in similar places; flowering time the same.

44. EPIDENDRUM PENDULUM.

Root: many fleshy fibres, like those of the two last, but they issue from one head.

Stem none.

Leaves radical, three to five, alternate, two-faced, &c. as in the two former; only that they are from one and a half, to three feet long, and about an inch and a half broad.

Scape radical, about two feet long, the lower three or four inches are involved in chaffy sheaths, the rest forms the raceme, or flower-bearing part, which is perfectly pendulous, many-flowered.

Bracts minute, one-flowered.

Petals lanced, spreading, equal, striated with rose-colour and yellow.

Nectary red, lower lip three-parted.

This is also a parasitic plant, a native of the same places, and flowering at the same time.

It differs but little from the Epidendrum aloifolium Linn. Kansjiram maravara of the Hortus Malabaricus.

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45. FERREOLA BUXIFOLIA.

Ehretia ferrea. *Willden. phytogr.* 1. *p.* 4. *tab.* 2. *f.* 2.

Pisonia? buxifolia. *Rottboell in nov. act. Hafniens.* 2. *p.* 536. *tab.* 4. *f.* 2.

Pishanna of the Telingas.

Irumbilli of the Tamuls. (*Koenig.*)

Trunk irregular. *Bark* dark rust-colour.

Branches very numerous, and very irregular.

Leaves alternate, short-petioled, oval, entire, very smooth, shining, firm, about half or three-quarters of an inch long, by half an inch broad.

MALE TREE.

Flowers from the axills of the lower leaves, three-fold, sessile, white, smaller than the female.

Calyx three-cleft.

Corol three-cleft, outside hairy.

Filaments six, short, inserted round a semi-globose receptacle.

Anthers oblong.

FEMALE TREE.

Flowers axillary, single, sessile, very small, white.

Calyx and *Corol* as in the male.

Germ oval.

Style short.

Stigma three-notched.

Berry round, smooth, red, pulpy, size of a large pea.

Seeds two, on one side flat, on the other round.*

* Description by Doctor Koenig.

Flores masculi.

Calyx monophyllus, parum ventricosus, pilosus, trifidus: laciniæ ovatæ, acutæ, erectæ, tubo breviores: tertia brevior, obtusior.

Corolla monopetala, tubulosa, glabra, subcarnosa, viridi-flavescens. *Limbus* trifidus: laciniæ erectæ, acutæ, extus pilis longioribus albis adpressis hirsutæ, intus nudæ.

Filamenta quinque, raro plura, receptaculo inserta, erecta, tubo corollæ multo breviora. *Antheræ* oblongæ, acutæ, erectæ, albæ, filamentis longiores.

Pistillum nullum.

Among the mountains, this grows to a small tree; but in the low countries it is only a shrub. Flowers during the hot season.

The berries, when ripe, are universally eaten, and are very well tasted.

The wood is dark coloured, remarkably hard and durable, and where its size will admit, is employed for such uses as require the most durable, heavy wood.

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46. DIOSPYROS MELANOXYLON.

Tumida of the Telingas.

Trunk erect, in large trees, from twenty to twenty-five feet to the branches, and about eight or ten in circumference. *Bark* scabrous, or deeply cracked, somewhat spongy, colour a mixture of gray and black in irregular strata.

Branches very irregular, numerous, rigid, forming a large, spreading, shady head; young shoots very downy.

Leaves nearly opposite, short-petioled, oblong, entire, obtuse, when young very downy, when old pretty smooth, about four inches long, and one and a half broad.

Stipules none.

MALE TREE.

Peduncle axillary, single, short, bearing three or four small, whitish flowers, supported by short, bowing pedicels.

Bracts: a small one at the insertion of each pedicel, and one or two still smaller, pressing the calyx.

Calyx and *Corol* as in the genus.

Filaments generally twelve or thirteen, short, inserted into a receptacle.

Anthers linear, erect.

Pistil none.

HERMAPHRODITE TREE.

Flowers rather larger than the male, axillary, single, nearly sessile.

Bract: a small one pressing the calyx.

Calyx always five-cleft, downy.

Corol five-cleft.

Filaments about ten, short, inserted into a receptacle, between the germ and the flower.

Anthers small, seemingly steril.

Styles three, nearly erect.

Stigmas bifid.

Berry round, size of a small apple, yellow, pulpy.

Seeds, from two to eight ripen, immersed in the pulp, kidney-form, sharp on the inner straight edge.

This ebony tree is a native of the woody and mountainous parts of the Circars; it grows to be very large, particularly the male tree, the wood of which is most esteemed. It casts its leaves in the cold

Flores feminei.

Calyx tubulosus, obsolete quinquangularis, hirsutiusculus, carnosus, quinquedentatus, apicibus parum incurvatis.

Corolla ut in mare.

Germen lineari-oblongum, in *Stylum* calyce longiorem desinens. *Stigma* planum, stellatim divisum in lobos, plerumque quatuor, parvos.

Bacca subglobosa, cum acumine prominulo, glabra, aurantiaco-rubra, magnitudine pisi majoris, basi cincta calyce persistenti, patellæformi, glabro. *Semina* duo, magna, extus convexa, intus plana.

season, and the new leaves appear again, with the flowers, in April and May.

The black part of the wood of this tree is too well known to require a particular description in this place. It is only the centre of large trees that is black and valuable, and the quantity found is more or less according to the age of the tree. The outside wood is white and soft, and either decays soon, or is destroyed by insects, which leave the black untouched.

The ripe fruit is eaten by the natives, but is astringent, and not very palatable.

47 DIOSPYROS SYLVATICA.

Tella-gada of the Telingas.

Trunk and *Branches* irregular. *Bark* dark rust-colour.
Leaves short-petioled, alternate, two-faced, oval, pointed, smooth, entire; from three to six inches long, and from two to three broad.

MALE TREE.

Umbellets axillary, single, peduncled, bowing, bearing many small, fragrant, white flowers.
Calyx and *Corol* as in the genus.
Filaments about eighteen, short, inserted into a receptacle.
Anthers single, linear, erect.

HERMAPHRODITE TREE.

Flowers single, short-petioled, axillary.
Calyx and *Corol* as in the genus, except that sometimes the calyx and corol are three-cleft.
Stamens three or four, small, and steril.
Styles three or four.
Stigmas lacerated.
Berry about the size of a nutmeg, round, pretty smooth.
Seeds from two to eight ripen.

It is a native of most of the uncultivated, hilly parts of the Circars, and, on the mountains it grows to a pretty large tree. Flowers during July and August.

48. DIOSPYROS MONTANA.

Yerra-gada of the Telingas.

Trunk crooked, covered with dark, rust-coloured, pretty smooth bark.
Leaves alternate, two-faced, short-petioled, oval, pointed, smooth on both sides, entire; three to four inches long, and about two broad.

MALE TREE.

Umbells axillary, simple, small, bowing.
Flowers nearly sessile, bowing, small, greenish-white.
Bracts small, oval, woolly, or with membranaceous margins.
Calyx as in the genus.
Corol contorted.
Stamens as in the genus, but inserted into the bottom of the tube.

HERMAPHRODITE TREE.

Flowers axillary, single, short-peduncled, bowing.
Calyx and *Corol* as in the male, but much larger.
Filaments four, short.
Anthers four, membrane-like, lanced.
Germ globular.
Styles four.
Stigmas bifid.
Berry as in the genus.

A middle sized tree, common among the mountains in the Circars. Flowers during the hot season, and does not cast its leaves till the new leaves come out.

The timber of this tree is variegated with dark and white coloured veins, and is hard, and very durable.

49. DIOSPYROS CHLOROXYLON.

Nella-woolymera of the Telingas.

Trunk irregular. *Bark* scabrous, dark rust-coloured.
Branches spreading, nearly two-faced.
Thorns often many, though sometimes wanting, large, and strong.
Leaves short-petioled, alternate, two-faced, oval, entire, below very downy; from one and a half to two inches long, and one broad.

MALE TREE.

Peduncle axillary, short, solitary, bowing, bearing generally about six minute, white flowers.
Calyx and *Corol* as in the genus.
Filaments about twelve, short, inserted into the bottom of the tube of the corol, several of them bifid, or bearing double anthers.
Anthers about sixteen, erect, linear.

HERMAPHRODITE TREE.

Flowers axillary, solitary, sessile, small, white.
Calyx and *Corol* as in the genus.
Filaments about eight, inserted into the bottom of the tube of the corol.
Anthers small, hearted.
Styles four.
Stigmas simple.
Berry size of a cherry, ripens two or three seeds only, although there are the rudiments of eight.

This is a tree of middle size, among the Orixa mountains: but in the low lands towards the coast it is only a large bush; flowers during the hot season.

The wood of the larger trees is yellowish, very hard and durable, and is used by the natives for various economical purposes.

The fruit, when ripe, is eaten raw, and is very palatable.

50. DIOSPYROS CORDIFOLIA.

Kak-woolymera of the Telingas.

Trunk irregular. *Bark* rust-coloured.
Branches scattered, spreading.

Thorns many, scattered over of the trunk and larger branches, very large, strong, frequently ramous.
Leaves alternate, short-petioled, two-faced, linear-oblong, hearted at the base, entire, soft, somewhat downy; about two inches long, and three-quarters broad.

MALE TREE.

Peduncle axillary, length of the petiole, single, bowing, bearing three small, white flowers.
Calyx and *Corol* as in the genus.
Filaments eight, short, inserted into the base of the tube of the flower, each bearing two linear, erect anthers.

HERMAPHRODITE TREE.

Peduncle axillary, length of the petiole, single, one-flowered.
Calyx and *Corol* as in the genus.
Filaments twelve, inserted into the bottom of the tube.
Anthers single, linear, erect.
Styles four.
Stigmas forked.
Berry round, size of a small crab-apple.
Seeds from six to eight ripen.

This is a pretty large tree, among the mountains in the Circars; but in the low lands towards the sea it is much smaller; flowers most part of the year.

The wood, when large, is dark-coloured, hard, and durable, and is used by the natives for many economical purposes.

51. CANTHIUM PARVIFLORUM.

Lamarck encyclop. 1. *p.* 602.

Tsjeru-Kara. *Rheed. mal.* 5. *p.* 73. *tab.* 37.
Ballusoo-Kura of the Telingas.

Trunk scarcely any, but branches innumerable; the small are regularly cross-armed, and spreading.
Thorns simple, opposite, above the axills, spreading, cross-armed, very strong, and very sharp: in luxuriant plants they are sometimes three-cleft.
Leaves on the young shoots opposite, on the elder branchlets fascicled, short-petioled, reflected, egged, entire, smooth, size various.
Stipules connecting, awled.
Umbellets opposite, below the thorns, small, about the length of the leaves.
Peduncle and *Pedicels* smooth, round.
Flowers small, yellow.
Calyx above, four-toothed: teeth acute, permanent.
Corol one-petaled: tube bellied, short; mouth downy; border four-parted: segments egged, expanded.
Filaments four, in the mouth of the corol.
Anthers egged.
Germ below, globular.
Style rather longer than the tube of the corol.
Stigma headed.
Drupe inverse-hearted, laterally compressed a little, with a hollow on each side, size of a cherry, crowned with the remaining calyx, fleshy, smooth, yellow, two-celled.
Nut: one in each cell, oblong, one-celled.

This is one of the most common scraggy, thorny bushes, on the coast, every soil and situation suiting it; flowers in the hot season, and makes excellent fences.

The ripe fruit is eaten by the natives; the leaves are universally eaten in curries: on both accounts the plant has the additional name Kura, which means esculent.

52. NAUCLEA PARVIFOLIA.

Bota-cadamie of the Telingas.

Trunk straight. *Bark* brownish-grey, cracked.
Branches opposite, numerous, spreading, forming a large, oval, shady head.
Leaves opposite, decussated, petioled, oval, entire, smooth.
Petiole channelled.
Stipules large, oblong, obtuse, glutinous, falling.
Peduncles terminal, single, or three; when three, the middle one is shortest, near the apex jointed, and bracted, each supporting a single globular, naked head of florets.
Bracts two, opposite, near the extremity of the peduncle, oval, falling.
Flowers small, light-yellow.
Receptacle chaffy: chaffs wedge-form, hairy at their insertions.
Calyx very minute, entire.
Corol one-petaled, funnel-form: tube widening; border five-parted, divisions pointed, spreading.
Filaments five, short, inserted just within the mouth of the tube.
Anthers erect, oblong, pointed above.
Germ beneath.
Style thread-form, nearly twice the length of the corol.
Stigma large, resting on the style.
Capsules top-shape, covered with a scabrous crust or bark, which splits irregularly when the seeds are ripe; within is the proper two-celled capsule, each consisting of one valve, opening round the apex, and down on the inside.
Seeds several, very minute, oblong, tailed, inverse, imbricated round the outside of their receptacles with the insertion downwards.

This grows to a large tree; a native of almost every part of the coast, but chiefly among the mountains; flowers during the cold season.

The wood is of a light chesnut colour, firm, and close grained. It is used for various purposes, where it can be kept dry; but if exposed to wet, it soon rots.

53. NAUCLEA CORDIFOLIA.

Daduga of the Telingas.

Trunk erect. *Bark* like that of the former.
Branches very numerous, horizontal, forming a very large shady head.
Leaves opposite, decussated, petioled, broad-hearted, pointed, entire, above pretty smooth, below downy, particularly when young, and beautifully reticulated with small veins; from four to twelve inches each way.
Petiole round, a little downy, from two to three inches long.

Stipules as in the former.
Peduncles axillary, from one to four, round, downy, length of the petioles, near the apex jointed, and bracted; each supports a single globular head.
Bracts oval, falling.
Flowers as in the former.
Calyx five-parted: divisions club'd.
Corol, Stamens and *Style* as in the former.
Stigma club'd.
Capsule wedge-form; the rest as in the foregoing species.
Seeds about six in each cell, surrounding their receptacle, oblong, not imbricated: membrane wing'd at the extremities: lower pointed; upper two-fork'd.

This, like the foregoing species, grows to a large tree, and is a native of the mountainous parts of this coast; flowers during the wet season; seeds ripe about April.

The wood is exceedingly beautiful, its colour like that of the box-tree, but much lighter, and at the same time very close grained; it is to be had of a large size, from one to two feet or more in diameter; is used for almost every purpose where it can be kept dry; for furniture it answers exceedingly well, being pretty, light, and durable.

54. NAUCLEA PURPUREA.

Bagadá of the Telingas.

Trunk irregular. *Bark* scabrous, ash-colour'd.
Branches opposite, decussated.
Leaves opposite, decussated, short-petioled, oblong, pointed, most entire, very smooth and shining both above and below; from four to nine inches long.
Stipules as in the two former.
Peduncles terminal, one or three, as in Nauclea parvifolia.
Flowers larger than in either of the former, purple.
Calyx, as in Nauclea cordifolia.
Corol, Stamens, Pistil, and *Style*, as in the former.
Stigma globular.
Capsule top-shape, wants the outer covering, two-cell'd: the cells two-valved on the out or convex side; on the inside, there is only the receptacle of the fruit, which is broad.
Seeds numerous, most minute, imbricated, with their insertions upwards.

A small tree; a native of the moist valleys among the Circar mountains; flowering time April (beginning of the hot season.)

55. EHRETIA ASPERA.

Willden. phytogr. 1. *p.* 4. *tab.* 2. *f.* 1.

Tella-juvie of the Telingas.

Trunk and larger *Branches* covered with dark rust-colour'd bark; young shoots downy.
Leaves alternate, petioled, egg'd, above scabrous, below downy, two or three inches long, and one or two broad.
Petiole channel'd, about an inch long.
Corymbe terminal, globular, composed of dense, recurved, one-row'd, spikes, divisions always two-fork'd.

Flowers very small, white.
Calyx: divisions egg'd, outside downy.
Corol: tube bell'd, not swelled at the base.
Style two-cleft.
Stigmas simple.
Berry size of a grain of pepper, red, marked with four angular elevations, corresponding with the angles of the four-parted nut.
Nut four-parted, smooth, each division one-cell'd.

This is a small bushy tree, or shrub, a native of dry, rocky, barren places; flowers during the wet season.

56. EHRETIA LÆVIS.

Serigada of the Telingas.

Trunk erect. *Bark* ash-colour'd.
Branches numerous, nearly erect.
Leaves alternate, short-petioled, oval, sometimes scollop'd, pretty smooth, three or four inches long, and about two or three broad.
Corymbes lateral, or axillary, two-fork'd, composed of thin, recurved, one-rank'd spikes.
Flowers white, small.

The parts of fructification as in the last, except that here the seeds, or nuts, are wrinkled on the outside. The chief specific difference is in the corymbes; there, they are terminal; here, lateral, or axillary.

This species grows to a pretty large tree, and is a native of our Circar mountains.

57. EHRETIA BUXIFOLIA.

Cordia retusa. *Vahl symb.* 2. *p.* 42.
Bupana-boory of the Telingas.

Leaves on the young shoots alternate, on the former branchlets fascicled, sessile, reflected, wedge-form, very scabrous, very hard, above shining, from half, to one inch long, and from about a quarter to half an inch broad.
Peduncle from amongst the leaves on the woody branchlets, from two to six-flower'd.
Pedicels very short.
Flowers small, white.
Calyx five-parted: divisions lanced, as long as the corol.
Corol bell'd; border five or six-cleft
Stamens five or six, shorter than the corol.
Style two-cleft.
Stigma simple.
Berry size of a pea, succulent, red.
Nut five or six-cell'd.

This is a middle-sized, ramous shrub; very common in barren lands and forests; flowering time the wet season.

58. CORDIA MONOICA.

Punagherie of the Telingas.

Bark grey.
Leaves alternate, petioled, oval, three-nerve, very scabrous, about three inches long, and two broad.
Petiole round, scabrous, about an inch and a half long.
Corymbe from the divisions of the branchlets, or terminal, small, two-fork'd, composed of short, recurved, one-row'd spikes.
Flowers small, white. There is a very large proportion of male, or barren flowers; they generally occupy distinct parts of the corymbe, but frequently the whole.
Hermaphrodite flowers as in the genus.
Berry size of a cherry, pointed, yellow, pulpy: pulp glutinous, as in Cordia Myxa.
Nut perforated at the apex, four-cell'd.
Male flowers want the style entirely, but have the rudiment of a germ.

A small irregular, poor-looking tree, chiefly a native of forests, where barren land predominates; casts its leaves in the cold season; flowers during the rainy season.

59. COMBRETUM DECANDRUM.

Arry-coota of the Telingas.

Stem woody, climbing.
Leaves opposite, reflected, short-petioled, oblong, acute, waved, smooth, about six inches long, and three broad.
Floral Leaves small, colour'd, downy.
Spikes numerous, terminal, and axillary.
Bracts opposite, lanced, one-flower'd.
Calyx bell'd, five-tooth'd.
Corol five-petaled.
Stamens ten.
Seed five-cornered: corners increased by broad membranaceous wings.

Is a large climbing shrub, a native of forests, and mountains; flowers during the cold season.

60. MOLINÆA CANESCENS.*

Coryvie of the Telingas.

Trunk very large. *Bark* ash-colour, a little scabrous.
Branches numerous, spreading in every direction.
Leaves alternate, abruptly feather'd, sometimes three'd, about six or eight inches long, and as many broad. *Leaflets* opposite, generally two pair, oblong, entire, smooth, shining, firm, about five or six inches long, and two or three broad.
Petiole round, four or five inches long.
Racemes many, simple or compound, from the extremities of the last

* A different species from the Molinæa of Commerson. *Juss. gen. p.* 248.

year's, or of two years old branchlets, or round the base of the present year's shoots.
Flowers small, white, fascicled.
Calyx five-leaved.
Petals five: four large standing on the upper side; the fifth is small, and stands single on the under side.
Stigma three-tooth'd.
Capsule three-sided, three-cell'd, three-valved.
Seeds one in each cell.

This is a native of the mountainous parts of the Circars, and flowers about the beginning of the hot season.

In the plate the dissected flower is magnified; the fruit of its natural size.

61. ORNITROPHE SERRATA.*

Tauatiky of the Telingas.

Leaves three'd: *Leaflets* oval, pointed, serrated, generally bubbled, margins frequently reflected, smooth; from two to three inches long, and about one and a half broad.
Racemes axillary, single, erect.
Flowers numerous, small, white, fascicled; *Male* and *Hermaphrodite* mixed.

HERMAPHRODITE FLOWERS.

Calyx four-leaved.
Petals four, placed on the upper side.
Filaments very woolly near the base.
Germs two.
Style single.
Stigma two-cleft: segments recurved.
Berry twin, singly globular, size of a pea, red when ripe, smooth, one-cell'd.
Seed, one in each berry.

MALE FLOWERS

exactly as the hermaphrodite, except the pistil which is wanting, or, at most, only rudiments of one are found.

This is one of the most common plants on the coast. Among the mountains, it grows to a small tree; on the low lands nearer the coast it is always a ramous shrub, with a grey, spotted bark. Flowers during the wet season.

The ripe berries are eaten by the natives.

The root is astringent, and employed by the native physicians, in substance, for diarrhœas.

62. SAPINDUS RUBIGINOSA.

Ishy-rashy of the Telingas.

Trunk perfectly erect, of considerable length and thickness.
Branches numerous, ascending.
Leaves alternate, abruptly feather'd, about a foot long. *Leaflets* opposite, four to six pair, oblong, pointed, entire, above smooth, below downy, about three inches long, and half an inch broad.

* A different species from the Ornitrophe of Commerson. *Juss. gen. p.* 247.

Petiole round, downy, ending in a downy bristle.
Panicle terminal, large, erect, composed of simple racemes.
Calyx five-leaved.
Petals four, placed on the upper side.
Style single, ascending, shorter than the stamens.
Capsules three, when all come to perfection (which is rare), singly oblong, one-cell'd.

A large timber tree, and a native of the mountainous parts of the Circars. Flowers about the beginning of the hot season.

The wood of this tree is very useful for a great variety of purposes, being large, straight, strong, and durable; towards the centre it is of a chocolate colour.

In the plate, the dissected flower is magnified; the fruit of its natural size.

63. PROSOPIS SPICIGERA.

Linn. Mant. 68.

Prosopis spicata. *Burm. ind.* 102. *t.* 25. *f.* 3.
Tshamie of the Telingas.
Vanni maram of the Tamuls. *(Koenig.)*

Trunk tolerably erect. *Bark* deeply crack'd, dirty-ash-colour.
Branches irregular, very numerous, form a globular, shady head.
Prickles scatter'd over the small branches, in some trees wanting.
Leaves alternate, abruptly feather'd, from two to three inches long; feathers from one to four inches; when in pairs, opposite, and have a gland between; one and a half inch long. *Leaflets* opposite, from seven to ten pair, obliquely lanced, smooth, entire, about half an inch long, and one-sixth of an inch broad.
Stipules none.
Spikes many, terminal, or from the exterior axills, thread-form, nearly erect.
Bracts minute, one-flower'd, falling.
Flowers numerous, small, yellow, single, approximated.
Calyx below, five-tooth'd.
Filaments united at the base.
Anthers incumbent; a white gland on the apex of each, which falls off soon after the flower expands.
Style crooked.
Legume oblong, pendulous, not inflated.
Seeds many, lodged in a brown, mealy substance.*

This grows to a large tree: is a native of most parts of the coast; flowers during the cold, and beginning of the hot season.

* Description by Dr. Koenig.

Rami majores crassi, pauci: adulti ramosiores, aculeati. *Ramuli* alterni, filiformes, numerosissimi, glabri, aculeati, apicibus flaccidis penduli, virides. *Aculei* in ramis adultis sparsi, conico-compressi, cinerascentes; in ramulis magis acuminati, erecti, breves.

Folia numerosa, patentia, alterna, petiolata, bipinnata: *Pinnæ* quaternæ: inferiores patentissimæ. *Glandula* umbilicata infra basin petiolellorum petiolo adnata. *Foliola* opposita, subsessilia, oblique oblonga, integerrima, acuta, utrinque glabra.

Spicæ axillares terminalesque, confertæ, filiformes. *Flores* parvi, sulphurei.

Calyx monophyllus, campanulatus, quinquedentatus, glaber, corolla tertia parte brevior.

Petala quinque, lineari-lanceolata, erecta, apice recurva, glabra.

Filamenta decem, basi petalorum adnata, æqualia, capillacea, longitudine corollæ. *Antheræ* oblongæ, sulcatæ, versatiles, fulvæ.

Legumen lineare, teretiusculum, utrinque attenuatum, articulatum, glabrum, spithamæum, vix crassitie pennæ anserinæ. *Semina* ovato-oblonga.

The pod of this tree is the only part used; it is about an inch in circumference, and from six to twelve long; when ripe, brown, smooth, and contains, besides the seeds, a large quantity of a brown, mealy substance, which the natives eat; it has a sweetish agreeable taste, and may be compared to the Spanish Algaraba, or Locust tree (Ceratonia siliqua).

64. SWIETENIA CHLOROXYLON.

Billoo of the Telingas.

Trunk tolerably erect, supporting a large, spreading, evergreen, shady head. *Bark* pretty smooth, dark rust-colour.
Leaves about the extremities of the branches, abruptly feather'd, six or seven inches long. *Leaflets* alternate, short-petioled, from ten to twenty pair, obliquely oval, obtuse, upper half twice the breadth of the lower, smooth, entire, one inch long, and three-eighths of an inch broad.
Petiole round, smooth.
Stipules none.
Panicles pretty large, terminal.
Flowers numerous, small, yellow.
Bract, small, below each subdivision of the panicle.
Calyx and *Corol* as in the genus.
Nectary: a fleshy notch'd ring surrounding the base of the germ.
Filaments ten, spreading.
Germ above.
Style short.
Stigma simple.
Capsule about one inch long, and half an inch in diameter, oblong, three-cell'd, three-valved, opening from the apex.
Seeds four in each cell, membrane-wing'd, alternately placed with four oblong, compress'd, spongy bodies, resembling the seeds themselves.

This is a middle-sized tree, a native of the mountainous parts of the Circars. Flowering time, the beginning of the hot season.

The wood of this tree is of a deep yellow colour, remarkably close grained, heavy, and durable; it is used for various economical purposes, and comes nearer box-wood than any other wood I have met with.

65. LAGERSTROEMIA REGINÆ.

Lagerstroemia Flos Reginæ. *Retz. obs.* 5. *p.* 25.
Adamboe. *Rheed. mal.* 4. *p.* 45. *t.* 20, 21.

Trunk erect. *Branches* horizontal, spreading. *Bark* smooth, rust-colour'd. Young shoots angular: angles wing'd as in Lagerstroemia indica.
Leaves opposite, or nearly so, short-petioled, oblong, entire, smooth, four or five inches long, by about two broad.
Stipules none.
Panicles terminal, pyramidal, rigid, about a span long.
Peduncle round, smooth.
Pedicels short, rigid, three-flower'd.
Bracts few, small, falling.
Flowers much larger, and much more beautiful than those of La-

gerstroemia indica; colour in the morning that of a pale rose, growing deeper and deeper through the day, and acquiring a purple tinge.

Calyx below, on the outside beautifully groov'd into trapezoid figures.

Corol as in Lagerstroemia indica.

Stamens numerous, all of the same size, inserted into the calyx.

Pistil, *Capsule*, and *Seeds*, as in the genus.

This is a native of many of the woody mountains of the northern parts of the Circars, where it grows to a tree of a middling size. Flowers during the hot season. Seeds ripe in August.

I know of no use any part of this tree is put to by the natives; it is very beautiful when in flower, and well deserves a conspicuous place in our gardens; it has flowered for some years in mine.

66. LAGERSTROEMIA PARVIFLORA.

Chinamghie of the Telingas.

Trunk erect. *Bark* smooth, ash-colour'd.

Branches very numerous, the large and lower spreading, the smaller nearly erect.

Leaves opposite, or in numbers from scabrous tubercles, very short-petioled, oblong, above smooth, shining, below covered with a whitish down, entire, from two to four inches long, and one or two inches broad.

Stipules none.

Peduncles terminal, and from the axills of the exterior leaves, erect, round, smooth, bearing in general from three to six flowers; or the whole extremities of the branchlets may be called a large leafy panicle.

Flowers small, white.

Calyx, *Corol*, *Stamens*, and *Pistil* as in the former.

Capsule smooth, oval, size of a small nutmeg, three or four-cell'd, three or four-valved.

Seeds wing'd, as in the genus.

This is a small tree, a native of our Circar mountains. Flowers during the hot season; seed ripe in August and September.

The wood of this tree is used by the natives for various economical purposes. Neither the flowers, nor the appearance of the tree, can recommend its being placed in the garden with the other two.

67. THUNBERGIA FRAGRANS.

Yeanadary Tiga of the Telingas.

Root consists of many thick, woody fibres.

Stem and *Branches* twining, woody, of considerable extent (two or three fathoms), jointed and swelled there from the insertions of the leaves or their cicatrices, round. *Bark* light ash-colour'd. Young shoots downy.

Leaves opposite, petioled, narrow-hearted, acute, behind tooth'd, slightly lob'd, or angular, three-nerved, scabrous, about three inches long, and one and a half broad.

Petiole about three quarters of an inch long, channel'd, bent in various directions.

Stipules none.

Peduncle axillary, solitary, one-flower'd, round, club'd, downy; one or two inches long.

Bracts none.

Flowers large, of the purest white.

Calyx as in the genus, except that the leaves of the exterior are acute and many-nerved.

Corol salver-form: *Tube* compress'd, enlarged about the middle, a little hairy, longer than the exterior calyx, bent to one side with a curve, border flat, five-parted: divisions equal, inverse-egg'd, with their extremities lop'd, and in general irregularly three-tooth'd, shorter than the tube.

Style length of the tube.

Stigma two-lob'd: lobes inverse-hearted, funnel-form.

Capsule sub-globular, flat-beak'd, two-cell'd, opening from the base with an elastic jerk.

Seed in general one in each cell, the other seldom or never ripens; round, rugose, with a large cavity (as in the Cocculi indici), which penetrates two-thirds of the seed.

This plant is common in hedges, among bushes, on the banks of water-courses, about Samulcotah; I have not met with it elsewhere. Flowers during the wet and cold seasons; when cultivated it flowers all the year.

The plant possesses a peculiar and agreeable fragrance, and the beauty of its flowers, though not fragrant, intitles it to a place in the flower garden.

68. FLACOURTIA SEPIARIA.

Canrew of the Telingas.

Stem very irregular. *Bark* dark rust-colour, smooth.

Branches numerous, straggling.

Thorns axillary, spreading, very numerous, large, and very sharp, leaf-and flower-bearing.

Leaves on the young shoots alternate, on older branches fascicled, short-petioled, reflected, oval, serrated, smooth, about three-fourths of an inch long, and half an inch broad.

Peduncle axillary, single, or many, undivided, one-flower'd.

Flowers small.

MALE FLOWERS.

Calyx five-leaved: *Leaflets* oblong, erect, woolly.

Corol none.

Filaments very numerous.

Anthers small.

FEMALE FLOWERS on a distinct plant.

Calyx as in the male.

Germ above, oval.

Styles three or four, short, a little spreading.

Stigmas simple.

Berry globular, succulent, size of a pea.

Seeds from four to eight.

This is a very common, thorny, shrubby plant, found in most woody uncultivated parts of the coast, both on mountains, and low lands. Flowers about the beginning of the hot season; berries ripe in July and August.

This bush answers well for fences, its thorns being so exceedingly strong and numerous.

The berries, when ripe, are eaten by the natives, and are sold in the public markets.

69. FLACOURTIA SAPIDA.

Pedda Caanrew of the Telingas.

Trunk irregular, but growing to the size of a small tree.
Thorns as in the former, but fewer, and even wanting sometimes.
Leaves alternate, short-petioled, oval, serrated, smooth, from one to two inches long, and from three-fourths to an inch broad.
Peduncle axillary, many-flower'd.
Male Flowers as in the former.
Female Flowers on a different tree.
Calyx as in the former.
Nectary a notch'd cup-like ring, surrounds the base of the germ.
Styles four or five.
Berry larger than in the former, and contains from six to twelve seeds, generally eight or ten.

This tree is a native of the mountainous parts only; flowers most part of the year.

The berries of this sort are also eaten, and are very palatable.

70. EMBRYOPTERIS GLUTINIFERA.

Embryopteris peregrina. *Gærtn. sem.* 1. *p.* 145. *tab.* 29.
Tumika of the Telingas.
Mangostan-utan of the Malays. *(Koenig.)*
Lym-appel of the Dutch. *(Koenig.)*

Trunk erect, straight, middle-sized. *Bark* pretty smooth, dark, blackish rust-colour.
Branches spreading, scatter'd; young shoots smooth.
Leaves alternate, short-petioled, two-faced, linear-oblong, pointed, smooth, firm, shining; when young, soft and red; six inches long by two broad.
Stipule, single, sheathed, which bursts and falls, when the leaf begins to expand.

MALE TREE.

Penduncle axillary, single, bowing, bearing three, four, or more, small, white flowers.
Bracte small, deciduous, below each pedicel.
Filaments about twenty, at the point bifid.
Anthers about forty, linear, erect.

FEMALE TREE.

Peduncle axillary, single, undivided, bearing one white flower, which is considerably larger than the male.
Filaments one, two, three, or four, small, short.
Anthers linear, small, sterile.
Germ globular.
Styles four, spreading.
Stigmas branched, generally three-cleft.
Berry, or rather apple, globular, size of a middle-sized apple, pulpy, rusty-yellow when ripe, and covered with a rust-colour'd farina.

Seeds eight, which generally all ripen, immersed in pulp, kidney-form, straight, edge thin.*

This is a middle-sized tree, growing in the moist, cool valleys, among the mountains in the Circars; it does not cast its leaves; flowering time March and April. The wood of this tree is of an indifferent quality, and not much used.

The ripe fruit is eaten by the natives, but I cannot say it is palatable: it is strongly astringent.

71, 72. BORASSUS FLABELLIFORMIS.

Linn. spec. plant. 1657.

Palmaira tree.
Potoo-Taady is the Telinga name of the Male tree.
Penty, or Nama-Taady, that of the Female.

Root consists of innumerable long, tough, very strong fibres, about the thickness of the little finger.
Trunk erect, generally from thirty to fifty feet high, though sometimes it attains the height of one hundred feet; it is everywhere marked with the hard, black cicatrices of the fallen leaves.
Fronds (leaves) surround the top of the tree, stip'd (petioled), round, composed of a great number of folded, linear-lanced divisions, which continue united about half way; from two to five feet each way.
Stipes stem-clasping, convex on the under side, and concave above, margins armed with a sharp, very hard, lacerated edge; from two to four feet long.

MALE FLOWERS.

Spathe universal, composed of many (ten to fourteen,) imbricated, smaller spathes, each vaginated at the base, but soon splitting in a long concave, pointed, boat-like sheath, in substance very strong and fibrous: when young, they are covered with a soft, downy, rust-colour'd substance; sometimes in the lower axills of the sheaths, there is a bundle of smaller sheaths, forming a spathe, like that now described, but without spadix. The superior four or seven sheaths embrace each ramification of the spadix, each ramification ending in two or three cylin-

* Description by Dr. Koenig.

Arbor grandis, *fronde* magna, globosa, Mangiferæ simillima. *Truncus* crassus, tectus *cortice* rugoso, atro-fusco.

Folia alterna, bifaria, lineari-oblonga, acuta, integerrima, utrinque glabra, coriacea, rigida, spithamæa. *Petioli* semiteretes, patentes, rigidi, semipollicares.

Masculæ arbores.

Corymbi axillares, parvi, nutantes, 4-7-flori.

Calyx monophyllus, urceolatus, coriaceus, flavicans, pilis raris albis adpressis tectus, caducus, parvus.

Corolla monopetala, urceolata, glabra, subcoriacea, albicans, calyce triplo longior, quadrifida: laciniæ acutæ, patentes.

Filamenta numerosa (usque ad 56), brevia, alba. *Antheræ* lineares, angulosæ, acutæ, erectæ, corolla parum breviores.

Femineæ arbores.

Flores plerumque solitarii. *Pedunculi* crassiores, petiolis vix breviores, supra basin cicatricula notati, ex bractea caduca.

Calyx monophyllus, quadripartitus: laciniæ erectæ, cordatæ, acutæ, integerrimæ, coriaceæ, albicantes, persistentes, magnæ.

Corolla major, profundius divisa, et minus urceolata, quam in mare.

Germen globosum, album, magnitudine pisi minoris, basi margine cinctum. *Styli* quatuor, patentes, pilosi, planiusculi, apice bifidi: laciniæ dentatæ, germine breviores.

Bacca globosa, parum depressa, tomento pulverulento rubro caduco tectum, magnitudine pomi vulgaris, 8-sperma. *Semina* ovata, acuta, compressa.

dric, bowing aments, most beautifully imbricated with innumerable scales.

Scales broad wedge-form, retuse, adhering by their lateral margins to the keel, or back of the next above, (when the ament stands erect) forming a cavity for a fascicle of about ten or twelve small, yellow, sessile, flowers; seldom more than one expands at a time, beginning with the uppermost, so that there is a long succession of them.

Bractes numerous, wedge-form, concave, surrounding the bundle of flowers.

Perianth proper, hid within the scales of the ament, three-leaved: *Leaflets* wedge-form, concave.

Corol elevated from the calyx, on a small, club'd, triangular, pedicel, which is of sufficient length to raise the flower above the scales; *Petals* three, oval, concave, points incurvate, spreading.

Filaments six, very short. *Anthers* linear.

FEMALE FLOWERS on a different tree.

Spathe compound as in the male.

Spadix is generally composed of only two branches.

Scales annular, imbricated, one-flower'd, splitting in various places, as the fruit increases in size, smooth; those nearest the base and the apex sterile.

Perianth proper, or *Corol* eight or twelve leaved: leaflets unequal, concave, firm, leathery, closely embracing the germ, permanent, and, with the fruit, increasing in size.

Filaments six to nine, united into a ring which surrounds the base of the germ.

Anthers oval, sterile.

Germ globular.

Style none.

Stigma a scaly navel as in Ficus, with generally four small striæ, which run from them, each ending in a dark-brown colour'd speck.

Drupe subglobular, with the apex flattened, size of an infant's head, smooth: skin leathery, dark-brown, shaded with dark yellow; inwardly replete with soft, yellow pulp, intermixed with tough, straw-colour'd hair.

Nuts from two to four, (generally three) inverse-broad-hearted, a little compress'd, of a tough horny substance, covered with much of the before mentioned hair, perforated in the notch of the apex.

Nucleus bears the general form of a nut, apex (not the base) three lob'd: on each side groov'd from the base of the apex; in substance somewhat cartilaginous, of a clear whitish colour; in the centre there is a transverse slit, which, on drying, enlarges into a cavity.

This, next to Caryota urens, grows to be the largest Palm on this coast. It seems to thrive equally well in all soils, and situations; but when the growth of high land, at a distance from the sea, the wood is much stronger, and every way better. It flowers during the beginning of the hot season.

When the seeds are young they are a pleasant, cooling jelly, much eaten by the natives, and the addition of a little sugar and rose-water makes them extremely palatable; the pulp of the ripe fruit is also eaten by the natives.

The tree, during the first part of the hot season, yields a pretty large quantity of Toddy (palm-wine), which is thus procured. The spadix, either male or female, is cut through just below where it begins to be divided into branches, and the juice is received into earthen pots suspended for that purpose; but it is necessary that a

small bit of the extremity of the divided spadix should be daily cut off, to remove the contracted, dry extremities of the vessels, and facilitate the flow of fresh juice. The Toddy is either drank fresh drawn from the tree, or fermented for distillation; or is boiled into a coarse kind of sapa, or rob, called Jaggary.

The wood of this palm, near the circumference, when of sufficient age (one hundred years or thereabout), is remarkably hard, black, heavy, and durable, and is universally used for rafters, in pent-roofed houses, for which purpose it is certainly the first wood in India. The centre is soft and spongy, containing little else than a coarse kind of farinaceous matter, intermixed with some soft, white, woody fibres, and is cut out; as the black, exterior, hard part only is employed.

By the natives, the leaves are universally used for writing upon, with an iron style, or bodkin. They are also employed for thatching houses, for making small baskets, mats, &c. and are formed into large fans, called vissaries.

Explanation of the Figures in Plate 71.

Fig. 1. Four branches of the spadix with their respective spathes, the whole reduced much below the natural size.
2. A portion of an ament, magnified.
3. The fascicle of unexpanded flowers, with the scale torn open to show their situation, magnified.
4. Two views of a flower.

Plate 72.

Fig. 1. The spathes and spadix, smaller than nature.
2. A portion of the same cut transversely.
3. A flower, natural size.
4. The same with the petals removed, shewing the sterile stamens.
5. The sterile stamens separated.
6. Sections of two germs.
7. A section of the ripe fruit.
8. One of the nuts with its hair and filament, which communicates with the stigma.
9. The same deprived of its hair.
10. A perpendicular section of the same, which exposes the embryo at the apex.

73. COCOS NUCIFERA.

Linn. spec. plant. 1658.

Nany-cadum, or Cobry-tshittoo of the Telingas.
Tenga of the Tamuls.

Spathe universal, axillary, cylindric-oblong, tapering equally towards each end, bursting longitudinally its whole length; texture somewhat woody, inside perfectly smooth, outside slightly striated lengthwise, two or three feet long.

Spadix nearly erect, very branchy, winding.

Branches simple, winding much, bowing a little.

Male Flowers numerous, above the female, approximated, very sessile.

Calyx three-leaved: leaflets small, broad-hearted, firm, fleshy.

Petals three, as in the Genera plantarum.

Female Flowers generally one, though sometimes none, near the base of each ramification of the spadix, and accompanied by a male flower on each side.

Calyx below, perhaps two-leaved, but it is difficult to say where the corol begins.

Corol six-petal'd, if two are allowed for the calyx; heart-shape, the exterior three much the largest, of a firm leathery texture, concave, and do not expand but in a trifling degree, except force be used.

Nectary: a thin orange-coloured ring surrounds the base of the germ.

Germ somewhat conical.

Style none.

Stigma small, immersed in the apex of the germ, slightly three-lobed.

The *Nut* is well described and delineated by Gærtner.

This tree delights in a moist, sandy soil, near the sea. Its uses and its produce, are various and well known.

Explanation of the Figures.

Fig. 1. A female flower, not open.
2. Back and front view of a male flower, magnified.
3. The same of a female flower, natural size.
4. Section of the germ near the apex. Ditto.
5. Another near the middle. Ditto.
6. A third section near the base. Ditto.

74. PHOENIX FARINIFERA.

Chitty-cita of the Telingas.

Trunk, the little it has is only about one, or at most two feet high, and so entirely enveloped in the leaves that it is never seen; the whole appearing like a large round bush.

Leaves feathered, as in Phœnix dactylifera (the Date tree); nearly as large. *Leaflets* longer, narrower, more pointed, of a much deeper green.

Spathe axillary, one-valved, inside concave, fitting the trunk or base of the leaf immediately within it: this concavity is bordered by two sharp edges, outside convex, there splitting longitudinally, leathery, smooth, withering.

Spadix erect, very ramous: branches simple, spreading in every direction; eight to twelve inches long.

MALE FLOWERS.

Calyx small, slightly three-tooth'd.

Petals three.

Filaments six, very short, inserted into a fleshy, globular receptacle.

Anthers oblong, erect.

FEMALE FLOWERS on a different plant.

Calyx as above.

Petals three, orbicular, equal, rigid, calyx-like, lasting.

Pistil as in Phœnix dactylifera.

Berry, when ripe, shining black, size of a large French bean; the pulp is sweet and mealy, but in small quantity. The natives eat them as gathered from the bush, without any preparation.

Seed cartilaginous, shape of the berry, grooved longitudinally, as in Phœnix dactylifera, pretty smooth, brown on the outside, light-greyish white within; on the middle of the back there is a small elevation, under which is an oblong pit containing the embryo.

This is a dwarf species of the Date tree, not taken notice of by any author I have met with. It is a native of dry, barren ground,

and chiefly found on the sandy lands at a small distance from the sea. Flowers in January and February; fruit ripe in May.

The leaflets are wrought into mats; the common petioles are split into three or four, and used for making ordinary baskets of various kinds; but they are not so proper for this purpose as the Bamboo, which is elastic, much more durable, and splits easily.

The small trunk, when divested of its leaves, and the strong brown fibrous web that surrounds the trunk at their insertions, is generally about fifteen or eighteen inches long, and six in diameter, at the thickest part; its exterior or woody part, consists of white fibres matted together, which envelope a large quantity of a farinaceous substance, used as food by the natives in times of scarcity; but it is also interwoven with many white fibres; to separate which from the farinaceous part, the trunk is split into six or eight pieces, then dried, beaten in wooden mortars, and afterwards sifted: the rest of the preparation consists in boiling the meal into a thick gruel, or (as it is called in India) conjee. It seems to be much less nutritive than the common sago, and is less palatable, being considerably bitter when boiled; but probably by more care in the preparation, or by varying the mode, it might be improved. It certainly deserves attention, as during the end of the last, and beginning of the present year, 1791, it saved many lives: rice being excessively dear, and at times not to be had, which obliged numbers of the poor to have recourse to this meal. It may further be remarked, that the tree fortunately is one of the most common on this part of the coast, particularly near the sea.

75. ARECA CATHECU.

Linn. spec. plant. 1659.

Po-ka-tshittoo of the Hindoos.

Spathe double.

Spadix very branchy.

Male Flowers very numerous, above the female, sessile, without bractes.

Calyx one-leaved, small, three corner'd, three-parted, smooth.

Petals three, oblong, rigid, striated, smooth, many times longer than the calyx.

Filaments, generally three, very short and broad; two-parted, inserted round the base of the columnar style.

Anthers always six, arrow'd.

Germ, no other than a short column, which splits into three short, obtuse segments.

Female Flowers in the same spadix, one, two, or three at, or near the base of each ramification of the spadix, sessile, without bractes.

Calyx six-leaved: the interior three largest, hearted, rigid, fleshy, permanent.

Corol none.

Nectary membranaceous, generally six-tooth'd, embracing closely the base of the germ.

Germ egg'd.

Style scarce any.

Stigmas three, short, triangular, seemingly united into one, conical, sharp.

Drupe well described and delineated by Gærtner.

Where it grows wild, I cannot say from my own observation, but it is cultivated over every part of India, and is in flower most

part of the year. It is the most beautiful Palm we have on the coast; the trunk grows remarkably straight, often to forty or fifty feet high; but in general is only about twenty inches in circumference, and almost equally thick, and smooth.

On the Malabar coast, the common black pepper-vines are usually trained up to this tree, which renders it more particularly useful in those parts.

76. VENTILAGO MADERASPATANA.

Gærtn. sem. 1. *p.* 223. *tab.* 49.

Yerra-Chirtaly of the Telingas.

Leaves alternate, short-petioled, two-faced, egg'd, most slightly saw'd, smooth; three or four inches long.
Panicle terminal.
Flowers very numerous, small, dirty-greenish colour; smell very strong and offensive, not unlike that of Sterculia fœtida.
Calyx, *Corol*, *Nectary*, *Stamens*, and *Pistil*, as in Rhamnus Jujuba.
Capsule globular, size of a pea, surrounded near the middle with the remaining nectary, and terminating in a long linear membranous wing, one-cell'd, not opening of itself.
Seed solitary, round.

A large, climbing, woody shrub; a native of forests and other uncultivated places among the mountains; flowers during the cold season. It is generally dicœcious.

77. CARISSA CARANDAS.

Linn. mant. 52.

Avigna in Sanscrit.
Caronda or Caraunda of the Bengalese.
Waaka of the Telingas.
Kalaaka of the Tamuls, and European nations on the Coromandel coast.

Trunk, when it has any, irregularly bent in various directions. *Bark* grey.
Branches and *Branchlets* very numerous, always two-fork'd, and standing nearly at right angles, rigid, round, smooth.
Thorns constantly in pairs, at the divisions of the branches and branchlets only; opposite, horizontal, very strong, round, smooth, exceeding sharp; frequently two-fork'd.
Leaves opposite, nearly sessile, oval, obtuse, smooth, hard, shining; their insertions remarkably regular, always one pair below the fork, crossed with the thorns, and another pair between the forks, where there are no spines.
Peduncles terminal, generally in pairs, each less than an inch long, bearing generally three beautiful milk-white, jasmine-like flowers.
Bracte, a small one at the insertion of each pedicel.
Calyx, *Corol*, *Stamens*, and *Pistil*, as in the genus.
Berry single (never two, not even the rudiment of more than one); size of a small plum, but of a more lengthened form; when ripe, shining black.
Seeds generally eight, oblong, compressed.

This is a very common, large shrub, or irregularly formed, small, ramous tree, growing in most wild, woody, dry, uncultivated parts; flowers in February, March, and April. Fruit ripe in July and August.

The shrub makes exceeding strong fences; the number of its strong sharp thorns rendering them impassable.

The fruit, just before it is ripe, is employed to make conserves of various kinds; and also to pickle: for which uses it is superior to every other fruit in the country, not even the Mango excepted. When ripe, it is universally eaten by the natives, and is tolerably pleasant to the taste, even of an European.

78. ULMUS INTEGRIFOLIA.

Naulie of the Telingas.

Trunk straight and high. *Bark* a little scabrous, dirty-grey colour.
Branches numerous, spreading so as to form a large shady head.
Leaves alternate, two-faced, short-petioled, egg'd, though sometimes hearted, entire, smooth, shining; from three to five inches long, and about two broad.
Stipules lanced, falling.
Flowers hermaphrodite and male mixed, from little gems over the naked branchlets.

HERMAPHRODITE FLOWERS.

Calyx, or *Corol*, four, five, or six-leaved: leaflets spreading, small, oval, falling.
Filaments seven, eight, or nine, exceedingly short.
Anthers linear, erect, two-lobed.
Germ above, inverse egg'd, end-nick'd, compress'd.
Styles two, short, incurved, permanent.
Stigmas acute, woolly.
Capsule pedicel'd, orbicular, leafy, compress'd, end-nick'd, one-cell'd, one-valved, not opening.
Seed one.

MALE FLOWERS.

Calyx and *Stamens* as above.
Pistil: no rudiment of one.

The first parts of the flower that appear are the anthers, they are then reddish; next the calyx increases, and becomes visible to the naked eye, but is at all times small, and if not looked for, may pass unperceived.

It is a very large timber tree, a native of the Circar mountains; flowers during the cold season; casts its leaves about the close of the wet season, but they come out again in March.

The wood is by the natives reckoned of a good quality, and employed for a variety of uses.

79. BAMBOS ARUNDINACEA.

Retz. obs. 5. *p.* 24.

Arundo Bambos. *Linn. spec. plant.* 120.
Mulleap Vedroo of the Telingas.
Mungil or Munkil of the Tamuls.

Stems (I fear to call them culms,) numerous, from ten to one hundred, from the same root, for some ten or twenty feet straight,

then bending gently to one side, piped, jointed, undivided, but with innumerable, very ramous, alternate, winding, two-faced, spreading, branches.

Thorns double or triple, alternate, on the joints of the branches and branchlets; when double, a branchlet occupies the centre; when triple, the largest thorn stands there; they are remarkably strong, sharp, and somewhat recurvate; sometimes they are wanting, particularly in a very rich moist soil.

Leaves sheathing, two-faced, most short-petioled, linear-lanced, upper side and margins backwardly hispid, broad at the base, fine pointed; from two to six inches long, and half or three quarters of an inch broad; but in the rich moist soil on the banks of the Ganges, they are from two to four inches broad, and about a foot long. Sheaths somewhat downy, with a few short, bent filaments, on each side of the mouth.

Inflorescence. When in flower, the tree is generally destitute of leaves; and, as the extremity of every ramification is covered with flowers, the whole seems one entire, immense panicle, composed of innumerable, somewhat verticill'd spikes; each verticil is composed of several two-ranked, oblong, pointed, sessile, rigid, spikelets.

Calyx common, calycled, from two to six-flower'd, two or three-valved: (*a a*) valvelets equal, oblong, concave, smooth, and of a firm texture, scales round the base, (*b*) small, oval, number uncertain; they are also often common to several minute sterile spikelets.

Hermaphrodite Flowers one, two, or three, below the male.

Calyx no other than the above described.

Corol two-valved: the exterior valvelet rather the shortest, oblong, pointed, smooth, cartilaginous; inner valvelet oblong, margins inflected, concave behind, and fringed with hairs round the elevated margins of the posterior concavity.

Nectary: three inverse egg'd scales embrace the insertions of the stamens and germ.

Filaments six, inserted round the base of the germ.

Anthers linear, incumbent.

Germ oval.

Style single.

Stigma two-cleft: divisions plumose.

Seed (*c*) firmly closed in the corol, is very like oats, and about the same size.

Male Flowers from one to three, above the hermaphrodite.

Calyx none.

Corol, *Nectary*, and *Stamens*, as in the hermaphrodite.

Pistil none.

It delights in a rich moist soil, such as the banks of rivulets and lakes, among the mountains.

It is unnecessary to mention the various purposes to which this most useful plant is applied in India, as they are already generally known.

Tabasheer or tabaxir of the Moors, Arabians, and Turks; Vedroo Paloo (milk of bamboo) of the Telingas; and Mungil Upoo (salt of bamboo) of the Tamuls; the substance so well described by Dr. Patrick Russell, in Vol. lxxx. of the Philosophical Transactions of London, is found in the cavities of the joints of this sort.

The Tamul physicians pretend that the root is a diluent; that the bark cures eruptions; and that the camphire, or salt (tabasheer) cures all paralytic complaints, as well as flatulencies, and poisons.

The leaves are esteemed a powerful emmenagogue; an opinion held also by the Chinese.

The seed is used for food, in the manner of rice.

80. BAMBOS STRICTA.

Male, or solid Bamboo.

Sadanapa Vedroo of the Telingas.

Stems fewer, straighter, and smaller, than in the common sort, otherwise they are the same.

Thorns oftener wanting.

Inflorescence the same as in B. arundinacea. *Verticils* sessile, globular, very dense, surrounding entirely the branchlet. *Spikelets* of the verticil crowded, two-ranked, &c. as in B. arundinacea.

Calyx as in the last, except that the scales are longer, and common to two or three spikelets; here the flowers are generally all hermaphrodite, and seldom more than three to the calyx.

Corol two-valved: exterior valvelet downy, with a very sharp dagger'd point; inner valve as in B. arundinacea. I could not perceive any nectary.

Stamens six.

Pistil woolly.

Stigma two-cleft, thread-form.

Seed as in the last.

This is evidently a distinct species. It grows in drier situations, is not near so large, has a much smaller cavity, and is very straight. Its great strength, solidity, and straightness, render it much fitter for a variety of uses than the common sort; and it is particularly employed by the natives to make shafts to their spears.

81. APONOGETON MONOSTACHYON.

Linn. suppl. 214. *Thunb. nov. gen. plant.* 4. *p.* 73.

Namma is the Telinga name of the plant, and Namma Dumpa the root.

Root tuberous, perennial.

Leaves radical, long-petioled, linear-oblong, at the base hearted, pointed, entire, smooth, three-five-nerved; from three to six inches long, and about one broad.

Scape as long as the leaves, a little striated, perforated by many pores, lengthways.

Spike elegantly winding, closely surrounded with flowers.

Bractes, *Calyx* or *Corol*, two wedge-form concave petals, inserted at the base of the two fissures between the inferior and two superior germs; permanent.

Stamens always six, shorter than the bractes.

Anthers blue.

Germs three, surrounded by the stamens.

Capsules three, pointed with the remaining style, smooth, one-cell'd, four- to eight-seeded.

Seeds oblong, inserted into the base of the capsule.

There is a variety, if not a distinct species, with hedge-hog'd two-seeded capsules, but in all other respects the same.

It is a native of shallow, standing, sweet water. Appears and flowers during the rains.

The natives are fond of the roots, which are nearly as good as potatoes.

82. MEMECYLON EDULE.

Alie of the Telingas.

Trunk very irregular in shape and size, covered with a dark-coloured scabrous bark.
Branches numerous, nearly erect.
Leaves opposite, short-petioled, egg'd, smooth, shining, firm, entire, scarcely any veins; from three to four inches long, and from two to three broad.
Umbellets many, compound, small; from scabrous elevations, where the leaves stood, over the old woody branches.
Peduncles common and partial, four-sided. *Pedicels* round, coloured.
The parts of fructification as described in Reichard's edition of the Genera Plantarum.
Seed: seldom more than one comes to perfection, though in the germs the rudiments of many are to be seen.

A very common small tree, or large shrub, in every jungle on the coast. Flowers about the beginning of the hot season.

The ripe berries are eaten by the natives; they have much pulp, of a bluish-black colour, and of an astringent quality.

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83. LIMONIA MONOPHYLLA.

Linn. mant. 237.

Adavie-nima (wild Lime) of the Telingas.

Trunk irregular. *Bark* pretty smooth, greenish ash-colour.
Branches numerous, very irregular.
Thorns single, axillary, very strong, and very sharp, but in many plants entirely wanting.
Leaves alternate, short-petioled, oblong, end-nick'd, smooth, firm, from two to three inches long, and one, or one and a half, broad.
Stipules awl'd.
Raceme axillary, short.
Bractes awl'd, small.
Calyx below, four-five-parted, permanent.
Corol four-five-petal'd, oval, equal, expanding. *Nectary* cylindric: mouth ten-tooth'd: teeth alternately longer.
Filaments none.
Anthers rest on the teeth of the nectary.
Germ above, globular.
Style length of the nectary.
Stigma four-five-lobed.
Berry size of a nutmeg, very like a Lime, hence comes the Hindoo name; commonly four-cell'd.
Seeds generally solitary.

Is a native of the large extensive forests on the coast, where it grows to a small tree, though oftener found in the state of a large shrub.

84. LIMONIA PENTAPHYLLA.

Retz. obs. 5. *p.* 24.

Gollunga of the Telingas.

Trunk scarce any. *Bark* ash-colour'd.
Branches numerous, nearly erect.
Leaves alternate, three'd, four'd, fiv'd, generally fiv'd, feather-form. *Leaflets* alternate, oblong, entire, smooth, shining, from two to three inches long, and about one and a half broad.
Petiole round, smooth.
Raceme terminal, and axillary, short, often compound, covered with a rust-coloured down.
Bractes small, concave, one under each subdivision of the raceme.
Flowers small, white, very fragrant.
Calyx and *Corol* as in the genus.
Nectary a notch'd ring surrounds the base of the germ.
Filaments swelled at the middle, alternately shorter.
Pistil as in the genus.
Berry round, red, smooth, size of a small cherry, pulpy.
Seeds one or two only come to maturity, though the germ has always the rudiments of five.

It is an elegant looking, fragrant shrub, very common on most uncultivated lands, but is found chiefly under large trees, where birds have dropped the seeds; flowers all the year.

The whole plant, when drying in the shade, diffuses a pleasant permanent scent, which I cannot describe, the flowers are exquisitely fragrant.

Birds eat the berries greedily.

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85. LIMONIA ARBOREA.

Conda Gollunga of the Telingas.

Leaves alternate, fiv'd. *Leaflets* alternate, linear, oblong, serrated, smooth, five inches long, and about two broad.
Panicles terminal, and from the exterior axills.
The rest as in L. pentaphylla.

It is a native of the mountainous parts of the Circars, where it grows to a middle sized tree, with a large, ramous, shady head.

The berries of this species are also eaten by birds, and the flowers are equally fragrant with those of the last described species; whether a difference of soil and situation can produce such difference between this and the L. pentaphylla, is doubtful: in their general habit they agree; the saw'd leaves are the chief specific distinction; for the increased size of the plant itself, and the panicles, cannot well be deemed characteristic.

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86. LIMONIA CRENULATA.

Tsjeru-Catu-Naregam. *Rheed. mal.* 4. *p.* 31. *tab.* 14.
Torellega of the Telingas.

Leaves on the young shoots, alternate, on the woody ramuli fascicled, feather'd with an odd one, three to four inches long. *Leaflets*

two-three pair, opposite, sessile, oblong, nearly equal, slightly notch'd, obtuse, smooth, texture slight, covered with numberless small diaphanous points, one inch long, and half an inch broad.
Petiole broad-wing'd, leaf-like, articulated.
Flowers white, small, fragrant, collected on small umbells, or racemes, over various parts of the branchlets.
Calyx small, four-tooth'd.
Petals four, lanced, spreading.
Nectary: a ring surrounds the base of the germ.
Filaments eight, rather shorter than the petals, broad towards the base, spreading.
Anthers incumbent, oval.
Germ above, sessile.
Style thick, shorter than the stamens.
Stigma oblong.
Berry size of a large pea, smooth, juicy, when ripe black, four-cell'd.
Seeds four, one in each cell, though it seldom happens that all come to maturity.

This species is generally found on the low lands near the coast, in form of a shrub, but among the mountains it grows to a middle sized tree. Flowering time the hot season.

87. GETONIA FLORIBUNDA.

Bandy-moorroodoodoo of the Telingas.

Stem woody, climbing.
Branches twiggy.
Leaves opposite, short-petioled, egg'd, pointed, downy, about three inches long, and two broad.
Panicles terminal and axillary, middle-sized, cross-armed.
Bractes single, below each flower, lanced.
Flowers opposite, without smell.
Calyx above, chaffy, very large, deeply five-tooth'd, permanent.
Filaments inserted into the mouth of the calyx, alternately lower.
Pericarp none, except the crust of the seed, oblong, five-striated, crown'd with the large withered calyx, and covered with rusty-colour'd down.

This is a large, climbing shrub, a native of forests: flowers in February and March.

88. ERYTHROXYLON MONOGYNUM.

Adave (*i. e.* wild) Gorinta of the Telingas.

Branchlets two-faced.
Leaves short-petioled, alternate, two-faced, wedge-form, rounded at the apex, entire, smooth, shining, about half an inch long, and three quarters of an inch broad.
Stipules single, within the leaf.
Peduncles axillary, generally one, two or three, short, one-flower'd.
Flowers small, yellow.
Nectaries: two exterior, as described in the genus; interior bell'd, surrounding the germ: margin ten-tooth'd, stamen-bearing.
Filaments a continuation of the teeth of the interior nectary.

Style single, rather longer than the stamens.
Stigma three-cleft.
Drupe size of a french bean, oblong, succulent.

Is a small irregularly formed tree, a native of vallies among the mountains in the Circars. Flowers in June or July.

89. OCHNA SQUARROSA.

Linn. spec. plant. 731.

Yerra-juvie of the Telingas.

Leaves alternate, short-petioled, oblong, acute, finely sawed, smooth, the youngest are remarkably colour'd, about four or five inches long, by two broad.
Panicles fascicle-like, from the naked branchlets, below the young leaves.
Bractes small, falling.
Flowers large, yellow, inodorous.
Calyx five-leaved: leaflets oblong, large as the petals in size, but not colour'd, permanent.
Petals from seven to twelve, generally nine or ten, oblong, falling.
Filaments short, permanent.
Anthers linear, erect, falling.
Germs generally as many as there are petals, surrounding a half-round receptacle.
Style from the apex of the receptacle, rather longer than the stamens, permanent.
Stigma perforated.
Pericarp none. Receptacle half round, colour'd, with a ridge for each seed or petal, that was in the corol; on each sits an oblong egg'd seed (as in Quassia), about the size of a large french bean, smooth; when ripe black. It is rarely that all the seeds come to perfection.

It is a small tree, a native of our Circar mountains. Flowers about the beginning of the hot season, at which time the leaves begin to come out, having cast them during the cold season.

90. GERARDIA DELPHINIFOLIA.

Linn. spec. plant. 848.

Antirrhino adfinis maderaspatana, capillaceo folio triphyllos, flore purpureo. *Pluk. amalth.* 17. *tab.* 358. *f.* 3.

Stem herbaceous, straight, ramous, four-angl'd, four-groov'd, about three or four feet high, spotted with dark purple.
Branches opposite, stem-like.
Leaves opposite, irregularly feather-cleft; divisions linear, as in Ipomoea quamoclit.
Flowers axillary, solitary, short-pedicell'd, large, rose-colour'd.
Bractes two, thread-form, press on the calyx laterally.
Calyx one-leaved, five-cleft: divisions linear, erect, permanent.
Corol one-petaled: *Tube* bellied, two or three times longer than the calyx: *Border* five-parted, segments equal, rounded.
Filaments four, two-powers, the superior pair end in a recurved hook; the inferior in an erect horn.
Anthers linear: the superior pair approach archwise, so that

their apices meet; the lower pair are firmly united their whole length.
Germ above, egg'd.
Style length of the tube.
Stigma enlarged, entire.
Capsule oblong, about as long as the calyx, two-cell'd, two-valved; receptacle columnar.
Seeds very numerous.*

This is a very elegant herbaceous plant, a native of the mountainous part of the country; flowers during the wet and cold season.

91. ÆGINETIA INDICA.

Linn. spec. plant. edit. 1. *p.* 632.

Orobanche Æginetia. *Linn. spec. plant. edit.* 2. *p.* 883.

Root, a number of fleshy fibres intricately interwoven.
Scapes several, straight, round, smooth, perfectly naked, except immediately at their base, where each is involved in a small sheath, about a foot long, one-flower'd.
Flowers large, of an elegant purple colour.
Spathe oblong, pointed, opening lengthways on one side.
Corol one-petaled: bottom of the tube erect, pitcher-form, above bent through the spathe horizontally, bellied; border five-parted: divisions equal, rounded.
Filaments four, two-powers.
Anthers twin, united by pairs.
Germ above, egg'd.
Style bent so as to correspond with the form of the corol, and is of the same length.
Stigma headed.
Capsule egg'd, pointed, size of a filbert, and although I have examined it in all stages, yet I have never been able to fix upon any determined internal structure; there are a number of convoluted laminæ throughout, between which are lodged innumerable, most minute seeds, like those of the Orchideæ.

A small, rare, rust-like, herbaceous, naked plant; a native of the hilly parts of the Circars.

* Description by Doctor Koenig.

Radices filiformes, subhorizontales, flexuosæ, lignosæ, albicantes.
Caulis erectus, dein in ramos patentissimos diffusus. *Rami* oppositi, quadrangulares, glabri, lignosi.
Folia opposita, patentia, setaceo-linearia: inferiora tripartita; superiora simplicia, subscabra, carnosa, obscure viridia, interstitiis longiora.
Flores axillares, solitarii, cauli adpressi. *Pedunculi* clavati, breves. *Bracteæ:* ad basin pedunculi una, linearis, vix pedunculo longior; ad basin calycis geminæ, oppositæ, erectæ, adpressæ, lineares, laciniis calycinis simillimæ, eisque parum breviores.
Calyx monophyllus, cylindricus, decemstriatus, striis quinque dorsalibus majoribus rubris, quinquefidus: laciniæ subæquales, lineares, acutæ, erectæ, longitudine tubi.
Corolla monopetala, purpurea, quinquefida: laciniæ ovatæ, ciliatæ, inæquales: duæ superiores recurvatæ, basi macula notatæ, minores; tres inferiores patentissimæ, macula obcordato-oblonga sanguinea intra faucem nudam.
Filamenta didynama, curvata, sanguinea, pilis albis adspersa, corolla breviora. *Antheræ* bilobæ: lobi superiores oblongi, convoluti, apice dehiscentes; lobi inferiores desinentes in spinulam conicam, acutam.
Germen oblongum, læve. *Stylus* erectus, ruber, pilis albis conspersus. *Stigma* clavatum, apice concavum.
Capsula oblonga, obtusa, bilocularis. *Semina* numerosa, clavata, punctata.

92. CYLISTA SCARIOSA.

Leaves three'd. *Leaflets* entire, downy, pointed: the exterior long-rhomb'd, the pair obliquely egg'd.
Stipules short, hearted.
Raceme axillary, erect, as long as the leaves.
Flowers many, yellow, hid in the calyx, except just when expanded, and then they only appear in front.
Calyx one-leaved, four-parted, chaffy, slightly downy, beautifully reticulated with colour'd veins; upper division shortest, broad, retuse; under division long, retuse; lateral parts smallest, hearted, permanent.
Corol, *Stamens*, and *Pistil*, as in Dolichos.
Legume obliquely oval, downy, hid in the calyx.
Seed one.

This plant is perennial, with a woody twining stem. A native of the mountainous parts of the Circars.

93. CÆSULIA AXILLARIS.

Stems herbaceous, towards the base creeping, and branchy, above erect, round, smooth; the erect parts from nine to fifteen inches high.
Leaves alternate, stem-clasping, lanced, saw'd, smooth, the base is much expanded so as to form a cup-like receptacle for the flower.
Flowers axillary, single, sessile, (the compound is meant,) a beautiful light purple.
Common Perianth many-leaved, unequal, the exterior two or three leaflets placed on the sides, are the largest and leaf-like. *Partial Perianth* one-flower'd, one-leaved, bellied, mouth contracted, margin two-cleft, permanent.
Corol compound: *Corollets* numerous, equal: tubes longer than their perianths; border five-cleft, spreading.
Filaments five, &c. as in the class.
Germ egg'd.
Stigma two-cleft.
Pericarp none; the belly of the partial perianth closely envelops each seed, forming its exterior covering.
Seed one, wedge-form, somewhat four-sided, crowned with the two divisions of the mouth of the partial perianth. +

Is a native of moist places. Flowers during the wet season.

+ Description by Doctor Koenig.

Radix fibrosa.
Caulis basi patens, ramosus, postea erectus, teres, glaber, pedalis, vel bipedalis.
Rami numerosi, brachiati, approximati, simplices.
Folia alterna, lineari-lanceolata, glabra, dentata, denticulis minimis remotis, plerumque infra capitula florum tria, inæqualia, quorum duo lateralia multoties minora, omnia basi dilatata.
Capitula planiuscula, parum convexa, e flosculis hermaphroditis numerosissimis compositi.
Calyx communis nullus. *Involucra* e basi trium foliorum dilatata in membranas venosas, coloratas, lacero-dentatas; et tribus vel duobus involucris propriis, latis, membranaceis, purpureo-albis, venis obscurioribus, magnitudine inæqualibus. *Paleæ* ad marginem disci plurimæ, figura dissimillimæ, pleræque tamen lineares, omnes acutæ, membranaceæ, purpureo-niveæ, vix longitudine florum.
Corolla composita uniformis: *Corollulæ* hermaphroditæ, æquales. *Propria* infundibuliformis, limbo patentissimo, quinquepartito: laciniis lineari-lanceolatis, cæruleo-purpureis.
Filamenta quinque, capillaria, brevia. *Anthera* cylindracea, tubulosa, limbo longior, atro-purpurea.

94, 95, 96. PANDANUS ODORATISSIMUS.

Linn. suppl. 424.

Mugalie is the Telinga name of the male plant, and Ghæzanghee that of the female.

Caldera is the name they are known by amongst Europeans on this coast.

Trunk: now and then a plant may be found with a single, pretty erect one, of ten feet in height, and a ramous round head; but this is seldom, for it is generally in form of a very large, ramous, spreading bush. From the stems or larger branches issue large carrot-shape, obtuse-pointed, roots, descending till they come to the ground, into which they enter and then divide. The substance of the most solid wood is something like that of a cabbage stem, and by age acquires a woody hardness on the outside.

Leaves confluent, stem-clasping, closely imbricated in three spiral rows, round the extremities of the branches, bowing; from three to five feet long, tapering to a very long fine triangular point, very smooth and glossy, margins and back armed with very fine sharp spines; those on the margins point forward, those of the back point sometimes one way, sometimes the other.

MALE FLOWERS.

A large, terminal, pendulous, compound, leafy, raceme, the leaves of which are white, linear-oblong, pointed, and concave; in the axill of each, there is a single thyrsus of simple, small racemes, of long-pointed, depending anthers; they are not sessile, but raised from the rachis of the raceme by tapering filaments.

FEMALE FLOWERS, on a different plant,

Terminal and solitary, having no other calyx nor corol than the termination of the three rows of leaves forming three imbricated fascicles of white floral leaves, like those of the male raceme, which stand at equal distances, round the base of the young fruit.

Germs numerous, collected in firm wedge-shape angular bundles of from six to ten or more (these form the compound germs of the future drupes), closely impacted round the receptacle.

Style none.

Stigma single, oval, groov'd lengthwise, yellow, affixed to the outside of a two-lipp'd umbilicus on the apex of the germ.

Fruit compound; oval, from five to eight inches in diameter, and from six to ten long, weighing from four to eight pounds; rough, rich orange-colour, composed of drupes numerous, wedge-shape, angular; when ripe, their large, or exterior ends, are detached from one another, and covered with a firm, deeper orange-colour'd skin; apices flat, consisting of as many angular, somewhat convex, tubercles, as there are cells in the drupe, each crowned with the withered stigma, internally; the exterior half of these drupes (next the apex) consists of dry spongy cavities, their lower part next the core or common receptacle is yellow, consisting of a rich-looking, yellow pulp, intermixed with strong fibres; here the nut is lodged.

Nut of each drupe compound, top-shape, exceedingly hard, angular, containing as many cells as there are divisions on the apex of the drupe; each cell is perforated above and below.

Germen inferum, obcordatum, compressum, alatum, coronatum valvis duabus oppositis, membranaceis, ovatis, acutis, coloratis, longitudine tubi corollæ. *Stylus* extra antheras parum prominens, bifidus, niveus.

Semina obcordata, compressa, alata, disco pilis raris brevibus tecto.

Receptaculum margine paleaceum, disco nudum, planum.

Seed single, oblong, smooth, adhering lengthways to a small fascicle of strong, white fibres, which pass through the perforation of the cell. By far the greatest number of these cells are barren.

It is a native of the warmer parts of Asia. All soils and situations seem to suit it equally well; it flowers chiefly during the rainy season.

This plant is much employed for hedges, and answers well, but takes much room. It grows readily from branches, whence it is rare to find the full grown ripe fruit. The male is by far the most common, a circumstance merely accidental; for I have seen some old extensive hedges entirely female, owing to there having been originally a female plant or plants nearest to these places.

It is the tender white leaves of the flowers (chiefly those of the male) that yield that most delightful fragrance, for which they are so universally and deservedly esteemed; and of all the perfumes that I know, it is by far the richest and most powerful.

The lower yellow pulpy part of the drupe is sometimes eaten by the natives in times of scarcity and famine, which, alas! occur too often; the tender white base of the leaves are also eaten raw or boiled, at such melancholy times. The taste of the pulpy part of the drupe is to me very disagreeable.

The fusiform roots, already mentioned, are composed of tough fibres, which basket-makers use to tie their work with; they are so soft and spongy as to serve the natives for corks; the leaves also are composed of longitudinal, tough, useful, fibres.

I have never known this plant cultivated with any other view than for fences.

Explanation of the Figures in the Plate 96.

Fig. 1. One of the fruits.
2. One of the drupes which compose the fruit.
3. A perpendicular section of the same.
4. A transverse section through the spongy part near the apex.
5. Another section where the nut is lodged, which shows two fertile, and nine abortive cells.
6. A third section near the base below the nut.
7. The upper part of the nut of the same drupe.
8. An under view of the same.
9. The receptacle or core.
10. One of the seeds affixed to its fascicle of fibres (*aa*). All are of their natural size.

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97. SALIX TETRASPERMA.

Trunk erect, but short, as thick as a man's body.

Head large, very ramous.

Branchlets twiggy.

Leaves alternate, short-petioled, broad-lanced, fine-pointed, most minutely saw'd, above smooth, below whitish, from two to four inches long.

Male Ament filiform; its peduncle often leaf-bearing, issuing from the dry, smooth, brown, involucre-like scales of the bud.

Perianth proper small, cup-form, with a long depending tongue-like lip.

Filaments six to eight, retrofracted, three or four times longer than the tongue of the perianth.

Anthers twin, singly orbicular, and groov'd.

Female Aments shorter than the male.

Perianth the same.

Germ long-pedicel'd.
Style length of the capsule.
Stigmas two, spreading.
Capsule heart-shape, opening from the apex, one-cell'd, four-seeded.
Seeds oblong, involved in much fine white cotton, which does not adhere to them, but is inserted with them into the bottom of the capsule.

This is the only species of Salix I have found in India. It is a middle sized tree, a native of the banks of rivulets and moist places far among the mountains. Flowers in the cold season.

98. GOUANIA TILIÆFOLIA.

Lamarck encyclop. 3. p. 5. Vahl symb. 3. p. 101.

Penky-tiga of the Telingas.

Tendrils simple, small, generally from the lower part of the racemes.
Leaves alternate, petioled, hearted, slightly saw'd or notch'd, smooth; two to four inches long.
Racemes terminal, and from the exterior axills, long, filiform.
Flowers numerous, small.
Bractes minute.
Perianth above, five-parted, as in Rhamnus.
Corol as in Rhamnus.
Nectary: the saucer-form part is here augmented by five emarginated spreading horns.
Filaments inserted into the margin of the nectary, alternate with its horns.
Germ below, three-sided.
Style three-cleft.
Capsule dry, triangular, three-cell'd, three-valved.
Seeds one in each cell.

Is a large climbing woody shrub, a native of the Circar mountains.

99. MIMOSA DULCIS.

Trunk ill shaped. *Bark* ash-colour'd, pretty smooth.
Branches numerous, somewhat twiggy; young shoots winding, and often reflected.
Thorns stipulary, suberect, sharp, but not long.
Leaves alternate, twice-double. *Leaflets* obliquely oblong, smooth, pointed, about an inch long. *Petiole* and *Petiolets* end in a sharp point.
Panicles terminal, thin, oblong, composed of diverging racemes of short pedicel'd, small, globular, heads of white corollets.
Filaments numerous, united below into a tube.
Legume swell'd, particularly at the seeds, twisted like a screw, a little downy, the valves themselves thin, almost membranaceous; when ripe, they open naturally, and expose to view

much rose-colour'd, firm, lobated, fleshy pulp, in which the black shining seeds are hid.

This is not a native of the coast of Coromandel, probably not of India; it has been introduced from the Philippine Islands, for the sake of the pulp which fills the legumes. In our gardens it grows quickly to a tree: a rich sandy soil suits it best. Flowering time the cold season.

I cannot as yet say any thing about the wood of this tree; its bark is astringent, like that of the rest.

The fleshy pulp of the legumes is reckoned wholesome; it is sweet, but insipid, and dryish; however, as the tree grows easily and very quickly, I conceive it well worth being reared for fences, instead of many less useful bushes and trees. The fruit would assist the poor in times of scarcity, and the gum, wood, and bark may also turn to account.

The Spaniards at Manilla, I am informed, rear many of the trees for the sake of the pulp of the legumes, which they call Sappan-fruit.

100. MIMOSA XYLOCARPA.

Conda-Tangheroo of the Telingas.

Trunk straight. *Bark* brown, pretty smooth.
Branches numerous.
Leaves scattered about the extremities of the branchlets, they consist of one pair of feathers upon a common petiole. *Leaflets* opposite, without a terminal odd one, from two to four pair; and with a single one below the pairs upon the outside; they are entire, oblong, smooth on both sides; the exterior pair are largest, and they are about five inches long, and two broad; those below are little more than half that size.
Petiole common, short, with a large brown gland between the feathers; partial petiole round, with a similar gland between each pair of leaflets.
Stipules lanced.
Peduncles axillary, two to four, two to three inches long, each ending in a globular head of fragrant florets.
Filaments ten, distinct, inserted into the bottom of the tube of the corol.
Legume broad-sickle-form, exceedingly hard and heavy, outside covered with brown farina, about six inches long, and three broad.
Seeds about ten, brown, smooth, each about as large as a kidney bean.

This is one of the largest species of the whole Genus that I am acquainted with. So far as I know, it is a native of the mountainous parts of the Circars only; casts its leaves during the cold season; flowering time the beginning of the hot season.

The wood of the tree is of a chocolate-colour towards the centre; the natives esteem it much, and use it for a great many purposes, where hard, durable, tough timber is required: for plough-heads it is particularly in request; the Telingas always employing the hardest and most durable wood, as they seldom use iron in their ploughs.

ERRATA.—Preface. Page 2, lines 12 and 18, for 1766, read 1776.
From page 1, to page 49, passim, for *Bract*, read *Bracte*.
Page 3, line 19, for *there*, read *where*—line 4 from bottom, for *light*, read *slight*.
Page 25, line 35; page 58, line 33; page 63, line 19, for *lengthways*, read *lengthwise*.

Cyrtocarpus Jacquini

Mackenzie Omnes fecit

Sirium myrtifolium.

Oldenlandia umbellata

Strychnos Nux vomica

Strychnos potatorum

Tectona grandis

Ceropegia bulbosa.

Ceropegia acuminata

Ceropegia tuberosa?

Ceropegia juncea (?)

Periploca esculenta?

Semecarpus Anacardium ?

Curculigo orchioides.

Mimusops Elengi?

Mimusops hexandra?

Cæsalpinia Sappan.

Swietenia febrifuga?

Gyrtnera racemosa?

Bassia latifolia

Dillenia pentagyna.

Butea frondosa

Butea superba

Ailanthus excelsa?

Sterculia urens.

Sterculia colorata?

Salvadora persica?

Hachen. e omnes fecit.

Ardisia solanacea.

Sideroxylon tomentosum ?

Buttneria herbacea?

Stapelia adscendens.

Grislea tomentosa

Roxburghia gloriosoides.

Uvaria cerasoides.

Uvaria suberosa.

Uvaria tomentosa?

Uvaria lutea.

Orchis plantaginea?

Limodorum virens.

Limodorum recurvum!

Limodorum nutans.

Limodorum aphyllum?

Epidendrum tapellatum ?

Epidendrum prae morsum?

Epidendrum pendulum.

Ferrola buxifolia

Diospyros melanoxylon?

Diospyros sylvatica ?

Diospyros montana ?

Diospyros chloroxylon?

Diospyros cordifolia.

Canthium parviflorum

Mackenzie omnes fecit.

Nauclea parvifolia ?

Nauclea cordifolia.

Vauclea purpurea.

Ehretia aspera

Ehretia laevis

Ehretia buxifolia

(Cordia monoica?)

Cymbretum decandrum.

Motinæa canescens

Ornitrophe serrata

Sapindus rubiginosa

Prosopis spicigera

Swietenia chlorexylon

Lagerstroemia Regina

Lagerstroemia parviflora

Thunbergia fragrans

Flacourtia sepiaria

Flacourtia sapida

Embryopteris glutinifera

Borassus flabelliformis

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Borassus flabelliformis

(Cocos nucifera.)

Phœnix farinifera

Areca Catechu

Ventilago maderaspatana.

Mackenzie Omnès fecit.

Carissa Carandas.

Ulmus integrifolia.

Bambos arundinacea.

Bambos stricta.

Potamogeton monostachyon

Memecylon edule.

Limonia monophylla.

Limonia pentaphylla.

Simonia arborea.

Limonia crenulata.

Gelonia floribunda.

Erythroxylon monogynum.

Ochna squarrosa.

Gerardia delphinifolia.

Aginetia indica?

Cylista scariosa.

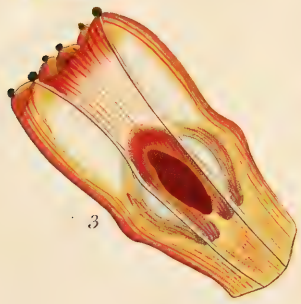
Cæsulia axillaris.

Pandanus odoratissimus.

Pandanus odoratissimus.

1

2



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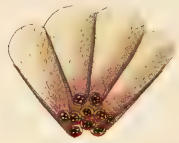

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Pandanus odoratissimus.

Salix tetrasperma ?

Gouania tiliaefolia.

Mimosa dulcis.

Mimosa xylocarpa.

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Top
Foot
Fore